



INTERNATIONAL DOCTORAL STUDENTS' CAREER DECISION-MAKING DURING COVID-19: A NARRATIVE REVIEW INFORMED BY PROSPECT THEORY

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ABSTRACT

Aim/Purpose	When the COVID-19 pandemic shut borders, disrupted research, and froze hiring, international doctoral students faced some of their life's most consequential career decisions. This paper addresses the underexplored issue of how these students made career decisions during this period of deep uncertainty and disrupted academic and professional trajectories.
Background	While prior studies have documented psychological and academic challenges faced by doctoral students during the pandemic, little attention has been given to the decision-making processes of international doctoral students regarding their post-PhD careers.
Methodology	A narrative literature review was conducted, synthesizing 16 peer-reviewed studies published between 2020 and 2025. The review applied prospect theory to interpret students' responses to career disruptions. The included studies span diverse geographic regions and employ qualitative, quantitative, and mixed methods.
Contribution	The study demonstrates the value of prospect theory in analyzing doctoral career decisions under crisis. It challenges linear models of career development and offers a more contextualized understanding of agency in career decision-making.
Findings	Mapped against the four constructs of prospect theory, the review finds that: <ul style="list-style-type: none">• Reference points: students recalibrated their reference points in response to disrupted expectations.

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	<ul style="list-style-type: none">• Loss aversion: decisions often prioritized avoiding setbacks, such as visa expiration or loss of academic progress, over pursuing new opportunities.• Risk seeking under uncertainty: some students pursued unconventional or high-risk career paths to avert certain losses.• Diminishing sensitivity: emotional responses diminished over time as students adapted to prolonged uncertainty.• The pandemic redefined success as resilience, stability, and adaptation.
Recommendations for Practitioners	Practically, this study calls for universities and doctoral programs to adopt flexible policies, offer transparent communication regarding immigration and funding, and expand definitions of success beyond traditional academic benchmarks to support international students during crises.
Recommendations for Researchers	Future studies should longitudinally track pandemic-era doctoral graduates, examine comparative institutional responses, and investigate how intersecting identities shape adaptability during disruptions.
Impact on Society	By uncovering how international doctoral students navigated high-stakes decisions during the pandemic, this paper informs the development of more equitable, supportive, and crisis-resilient systems in global higher education.
Future Research	Research should explore long-term career impacts of COVID-19 on international PhD graduates, institutional preparedness for future crises, and the intersectional dimensions of vulnerability and resilience in doctoral education.
Keywords	international doctoral students, COVID-19, career development, prospect theory

INTRODUCTION

International doctoral students form a distinctive and highly consequential segment of the global research community. Beyond representing a significant proportion of doctoral enrollments – over one-third of science and engineering doctorates in the United States in 2021 (National Center for Science and Engineering Statistics, 2024) – they bring unique contributions to host institutions and societies. Prior research has shown that these students play a pivotal role in fostering cross-border knowledge exchange and building transnational academic networks (Marginson, 2016), enriching host-country research capacity through diverse perspectives, methodological approaches, and cultural understandings (Friesen, 2011). They also contribute disproportionately to scientific publications, patents, and collaborative research outputs, thereby enhancing the innovative capacity of their host nations (Grogger & Hanson, 2015). As such, understanding their career decision-making is critical not only for supporting individual academic trajectories but also for sustaining the vitality and competitiveness of research systems worldwide.

The COVID-19 pandemic upended higher education on a global scale in 2020, creating unprecedented challenges for doctoral education (Arantes do Amaral et al., 2023; Levine et al., 2021). It struck at a critical juncture for many aspiring students, potentially derailing carefully laid career plans. A scoping review showed that COVID-19 disrupted multiple facets of international student mobility and outcomes: visa regimes changed, skill development opportunities were curtailed, doctoral study durations were extended, and job openings sharply contracted (Mihut et al., 2025). These impacts constituted a double blow for many, occurring just as students needed employment or stability the most, and exacerbated pre-existing inequalities, especially for students of color, mothers with caregiving responsibilities, those in the natural sciences, and candidates in the mid-phase of their studies (Le et al., 2021; Liera & Rodgers, 2025; Pyhältö et al., 2023a).

In this context, understanding how the COVID-19 pandemic affected international doctoral students' career responses is a question of both practical and scholarly significance. Existing research from various countries highlighted issues like interrupted research progress, uncertainty in the academic job market, and heightened psychosocial stress among doctoral students (King & Dahal, 2022; Levine et al., 2021; McGee et al., 2021). However, far fewer studies have explored how international doctoral students made career decisions during this time of crisis. In particular, existing research rarely addresses how these students reasoned under risk and uncertainty when their expected career paths were disrupted. This literature gap is significant because understanding the psychological and cognitive processes behind students' choices can inform more effective support systems and policy responses.

This paper aims to fill that gap by conducting a narrative review on how international doctoral students made career decisions during the COVID-19 pandemic. The review is guided by two research questions: (1) How did the COVID-19 pandemic impact the career trajectories and post-PhD plans of international doctoral students worldwide? (2) In what ways can prospect theory help explain these students' career decision-making during the pandemic?

Prospect theory (Kahneman & Tversky, 1979) offers a valuable framework for examining decision-making under uncertainty. It focuses on how people evaluate options in terms of gains and losses relative to a reference point and how this framing influences risk-taking behaviors (Cartwright, 2014). Applying prospect theory can illuminate how international doctoral students responded to disrupted career prospects, how they recalibrated their aspirations, and why they made the choices they did amid pandemic-induced uncertainty. For instance, did students become more risk-averse, opting for "safer" career paths in response to the perceived loss of academic opportunities? Or, conversely, did some take bold risks, believing they had "nothing to lose"? Prospect theory provides a lens to analyze such questions.

The findings of this review are organized around the four core constructs of prospect theory: shifting reference points as students recalibrated career and academic goals; loss aversion in prioritizing the protection of progress, legal status, and stability; risk-seeking under uncertainty in pursuing unconventional or high-stakes options to avoid certain setbacks; and diminishing sensitivity as emotional responses softened over time. This theoretical framing provides a coherent lens for interpreting how international doctoral students navigated career decision-making amid a global crisis.

METHODOLOGY

This study adopts a narrative literature review approach to synthesize findings from recent studies (2020–May 2025) on the impact of COVID-19 on international doctoral students' career decisions. A narrative review was chosen to construct an interpretive account using prospect theory as the guiding analytic framework. Unlike systematic reviews, which require strict inclusion protocols and typically suit well-established fields, narrative reviews are more appropriate for emerging research areas where study designs, contexts, and frameworks vary (Baumeister & Leary, 1997).

SEARCH AND SCREENING STRATEGY

The literature search (Figure 1) was conducted across several academic databases, including Education Source, Education Resources Information Center (ERIC), and Educational Administration Abstracts, covering the period from 2020 to May 2025. The review was limited to peer-reviewed journal articles, excluding reports, conference proceedings, and book chapters. The following keyword combinations were used in the search: "COVID-19" OR "pandemic" OR "coronavirus"; "doctoral students" OR "PhD candidates" OR "graduate students"; "career" OR "employment" OR "job"; and "international" OR "foreign." The initial database search yielded 85 records, of which only one focused exclusively on international doctoral students. An additional four studies included international doctoral students as part of a broader participant group.

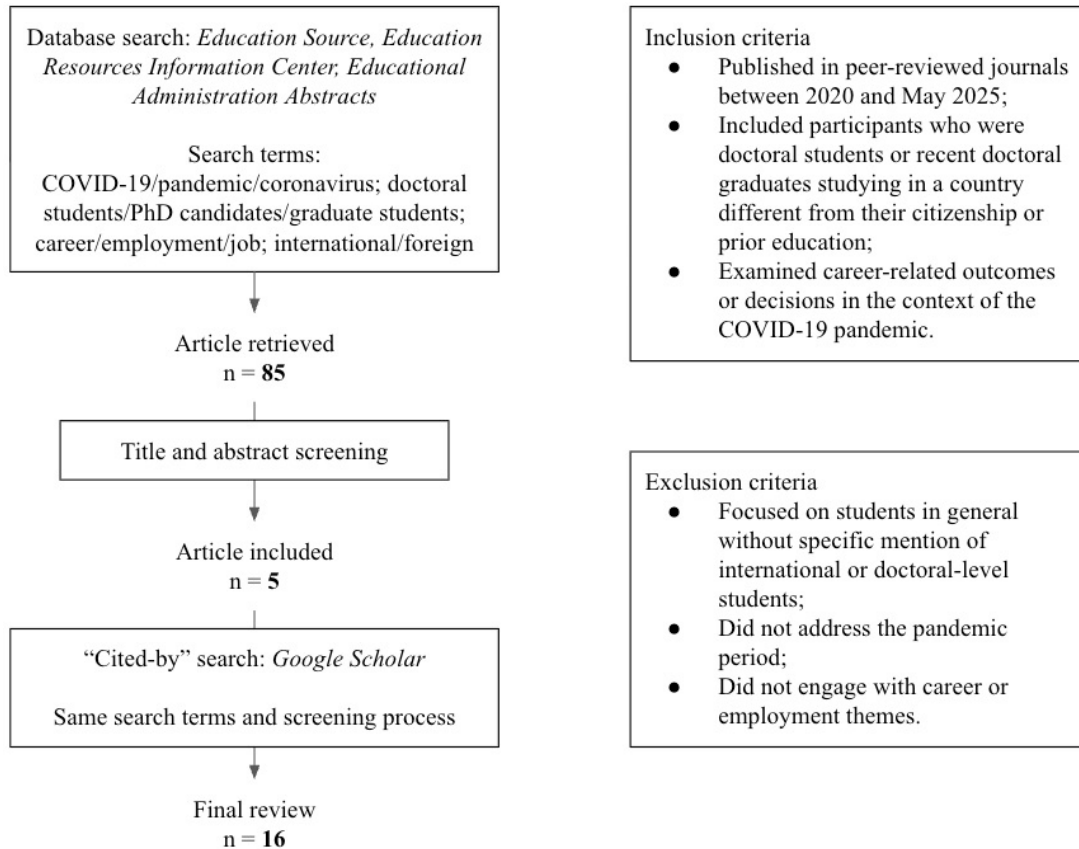


Figure 1. Literature search process

To enhance coverage and account for potential gaps in database indexing, a second round of searching was conducted using Google Scholar with the same search terms. Additionally, backward and forward citation tracing was employed: reference lists of key papers were reviewed for relevant studies, and citing articles were examined to identify more recent contributions. This process added 11 additional sources that met the inclusion criteria and aligned with the review’s focus, resulting in a final sample of 16 studies.

Studies were included if they: (a) were published in peer-reviewed journals between 2020 and May 2025; (b) included participants who were doctoral (PhD or equivalent) students or recent doctoral graduates studying in a country different from their citizenship or prior education (i.e., international students); and (c) examined career-related outcomes or decisions in the context of the COVID-19 pandemic. Both empirical research (qualitative, quantitative, or mixed methods) and reflective or conceptual papers were eligible for inclusion. In terms of career-related themes, the review considered a broad scope of outcomes, including job market experiences, career decision-making, changes in career plans, and factors likely to influence future careers, such as disruptions to research progress, skill acquisition, and professional networking.

Studies were excluded if they focused on students in general without specific mention of international or doctoral-level students, did not address the pandemic period, or did not engage with career or employment themes. For instance, papers were excluded if they focused solely on mental health or online learning satisfaction without connecting those experiences to future career implications. Research centered exclusively on master’s or postdoctoral students was also excluded unless findings were disaggregated, in which case doctoral-specific insights were emphasized. Finally, studies published in languages other than English were excluded due to resource constraints, a limitation given the global relevance of the topic.

LITERATURE ANALYSIS STRATEGY

This review synthesizes findings from 16 peer-reviewed journal articles published between 2020 and 2025 that examine the impact of COVID-19 on international doctoral students' career trajectories. To interpret how students responded to risk, uncertainty, and disruption during the pandemic, this review applies prospect theory as its analytical framework. Developed by Kahneman and Tversky (1979), prospect theory emphasizes how people make decisions under uncertainty by evaluating outcomes relative to a reference point, exhibiting loss aversion, diminishing sensitivity, and varying risk preferences depending on whether they perceive themselves in the domain of gains or losses. This framework offers a compelling lens for understanding doctoral students' career decisions during a period marked by widespread disruption, limited options, and heightened uncertainty.

Using prospect theory as the analytical frame, the literature was synthesized across four key constructs:

- (1) *Reference points*: Individuals evaluate outcomes relative to a reference point (often the status quo or their expected situation) rather than on an absolute scale (Kahneman & Tversky, 1979). An outcome is perceived as a gain if it exceeds the reference point and a loss if it falls below it. For international doctoral students, the pre-pandemic expectations – such as completing a degree within a specific timeframe, securing a postdoctoral or academic job in the host country, or following a particular migration or return path – served as these reference points. COVID-19 disrupted or rendered many of these expectations obsolete. This review examines how international doctoral students' career expectations were recalibrated in response to changing circumstances.
- (2) *Loss aversion*: A cornerstone of prospect theory is that losses typically loom larger than equivalent gains. That is, the pain of losing something is more intense than the joy of gaining something of the same value (Kahneman & Tversky, 1979). People tend to place greater emphasis on avoiding losses than on pursuing gains. In the doctoral education context, this may manifest in students' strong aversion to "losing" the investments they had made in their PhD programs, whether in terms of time, effort, or financial cost. Literature was analyzed for evidence that students acted more decisively to avoid losses than to pursue new opportunities.
- (3) *Risk-seeking under uncertainty*: Prospect theory also predicts that individuals tend to be risk-averse in the domain of gains but risk-seeking in the domain of losses (Kahneman & Tversky, 1979). When faced with a certain loss, people may take bold or uncertain actions to try to avoid or offset that loss. International doctoral students during the pandemic faced intense uncertainty around job markets, visa rules, institutional support, and future mobility. This review examines how these uncertainties influenced students' tolerance for risk.
- (4) *Diminishing sensitivity*: Prospect theory posits that individuals' sensitivity to changes diminishes as the magnitude of gains or losses increases (Tversky & Kahneman, 1992). In other words, the psychological impact of each additional gain or loss becomes less pronounced over time. The review assessed how emotional and behavioral responses evolved over time, and how gradual normalization of adversity emerged.

By mapping each study's findings onto these four constructs, the review developed a behavioral interpretation of how international doctoral students navigated their disrupted career trajectories during COVID-19. Each study was assessed for how students evaluated expectations, responded to setbacks, adapted to prolonged disruptions, and made choices under uncertainty. This analytical strategy moves beyond merely cataloging challenges, offering a nuanced understanding of the emotional and cognitive processes that shaped students' behavior during the pandemic. It prompts us to ask the following questions: What were students' reference points before and during COVID-19? Which outcomes did they frame as losses versus gains? How did that framing affect their willingness to take risks or seek safety in their career choices? By foregrounding these questions, this study offers both theoretical and practical insights into doctoral career development in times of crisis.

To minimize bias in this narrative review, I applied transparent inclusion and exclusion criteria, conducted searches across multiple databases, and used both backward and forward citation tracing to capture relevant literature that might not be indexed consistently. The interpretive synthesis was guided by a deductive approach from the outset, using the four constructs of prospect theory as the organizing framework. While the analysis was deductive in structure, I remained open to inductive insights within each construct, which allowed emergent themes to be incorporated without departing from the theoretical framing. This process ensured that interpretations were both theory-driven and grounded in the specific evidence presented by the included studies.

DESCRIPTIVE ANALYSIS OF LITERATURE

The final set of 16 peer-reviewed journal articles in this review spans diverse geographic and disciplinary contexts, reflecting the global scope of COVID-19's impact on international doctoral students. The studies encompass major host countries for international PhD students, including the United States (e.g., Donohue et al., 2021; Wang & DeLaquil, 2020), the United Kingdom (e.g., Jackman et al., 2022; Zhang et al., 2022), Canada (Y. Xu, 2022), Australia (e.g., Gomes, 2022; Phan et al., 2025), New Zealand (Spronken-Smith et al., 2023), Finland (Pyhältö et al., 2023a, 2023b), Sweden (Börgeson et al., 2021), and Malaysia (Abdul-Rahaman, 2023).

Disciplinarily, the reviewed works include both general doctoral populations and field-specific cohorts. While many studies sampled students across various disciplines, a few focused on specific fields, such as biomedical sciences (Börgeson et al., 2021), social work (King & Dahal, 2022), and communication sciences (Covington & Jordan, 2022). These discipline-specific lenses offer additional granularity in understanding how research modality (e.g., lab-based vs. theoretical work) shaped students' pandemic experiences.

In terms of methodology, the literature is predominantly qualitative, reflecting a common strategy to rapidly capture lived experiences during a crisis. Narrative approaches (Alsunaydi, 2021; Wang & DeLaquil, 2020; Y. Xu, 2022), interviews (e.g., Gomes, 2022; Phan et al., 2025; X. Xu & Tran, 2022), and digital diaries (Phan et al., 2025) were widely used to document student perceptions, emotions, and coping strategies. Nonetheless, quantitative and mixed-methods studies also contributed valuable statistical insights, including large-scale surveys in Sweden (Börgeson et al., 2021), Finland (Pyhältö et al., 2023a, 2023b), and New Zealand (Spronken-Smith et al., 2023), and mixed-methods surveys in the United States and the United Kingdom (e.g., Covington & Jordan, 2022; Zhang et al., 2022).

Although some studies focused explicitly on international doctoral students (e.g., Gomes, 2022; Phan et al., 2025; X. Xu & Tran, 2022), many addressed broader doctoral populations or international students in general. In such cases, I extracted data and insights specifically relevant to international doctoral students and their career-related concerns. For example, Zhang et al. (2022) included undergraduate through doctoral-level Chinese students, but doctoral-specific data were disaggregated through interviews.

Taken together, this descriptive analysis affirms that while scholarship on COVID-19 and doctoral education is rapidly expanding, studies that center on international doctoral students' career trajectories remain limited. The findings presented below synthesize the best available evidence to date, acknowledging that more data will continue to accumulate beyond this search window, especially concerning long-term outcomes.

FINDINGS: PROSPECT THEORY ANALYSIS OF LITERATURE

The findings are organized around four constructs of prospect theory: reference points, loss aversion, risk-seeking under uncertainty, and diminishing sensitivity. A summary table (Table 1) highlighting key themes and supporting sources is also provided.

Table 1. Literature review findings summary

Construct	How it is operationalized	Representative themes and studies
Reference points	Pre-pandemic expectations (timely completion, in-person mentoring, postdoc jobs, migration plans) used by students to judge gains/losses during COVID-19	<ul style="list-style-type: none"> • Pre-pandemic expectations as benchmarks (Abdul-Rahaman, 2023; Börgeson et al., 2021; Donohue et al., 2021; Gomes, 2022; Jackman et al., 2022; Pyhältö et al., 2023a, 2023b; Wang & DeLaquil, 2020; X. Xu & Tran, 2022; Y. Xu, 2022) • Pandemic disruptions breaking reference points (Börgeson et al., 2021; Donohue et al., 2021; Jackman et al., 2022; Pyhältö et al., 2023a; Spronken-Smith et al., 2023) and intensified disruption for international students (Covington & Jordan, 2022; Donohue et al., 2021; Phan et al., 2025; Spronken-Smith et al., 2023; X. Xu & Tran, 2022) • Recalibration of success toward feasibility (Alsunaydi, 2021; Gomes, 2022; Phan et al., 2025; Wang & DeLaquil, 2020; Y. Xu, 2022) • Variations by personal/national contexts (Alsunaydi, 2021; Börgeson et al., 2021; King & Dahal, 2022; Zhang et al., 2022)
Loss aversion	Preference for avoiding setbacks (visa lapses, missed funding, delayed progress) over pursuing uncertain gains	<ul style="list-style-type: none"> • Priority on avoiding loss over pursuing gains (Donohue et al., 2021; Phan et al., 2025) • Perceived academic and professional losses (Alsunaydi, 2021; Börgeson et al., 2021; Covington & Jordan, 2022; Donohue et al., 2021) and heightened stakes for international students (Abdul-Rahaman, 2023; King & Dahal, 2022; Spronken-Smith et al., 2023; Zhang et al., 2022) • Career plan compromises (Abdul-Rahaman, 2023; Spronken-Smith et al., 2023) • Emotional impact and adaptive responses (Gomes, 2022; Phan et al., 2025; X. Xu & Tran, 2022; Y. Xu, 2022)
Risk-seeking under uncertainty	Willingness to take unconventional options when facing “certain loss” scenarios	<ul style="list-style-type: none"> • Academic risks (Börgeson et al., 2021; Donohue et al., 2021; Jackman et al., 2022; X. Xu & Tran, 2022) • Career risks (Gomes, 2022; Phan et al., 2025; Spronken-Smith et al., 2023; Y. Xu, 2022; Zhang et al., 2022) • Visa-related gambles (Abdul-Rahaman, 2023; Covington & Jordan, 2022) • Agency under constraint (Abdul-Rahaman, 2023; Phan et al., 2025; Spronken-Smith et al., 2023; Zhang et al., 2022) • Uneven adoption (Phan et al., 2025)
Diminishing sensitivity	Attenuation of emotional response as disruptions persist; normalization of adversity	<ul style="list-style-type: none"> • Initial acute distress to gradual adaptation (Alsunaydi, 2021; Börgeson et al., 2021; Wang & DeLaquil, 2020;) • Stabilizing through coping strategies and new routines (Abdul-Rahaman, 2023; Covington & Jordan, 2022; Donohue et al., 2021; Gomes, 2022; Jackman et al., 2022; King & Dahal, 2022; Phan et al., 2025; Spronken-Smith et al., 2023) • Shift in emotional investment (Phan et al., 2025; Y. Xu, 2022; Zhang et al., 2022). • Uneven patterns (Pyhältö et al., 2023a)

REFERENCE POINTS: SHIFTING BASELINES AMID THE PANDEMIC

Before the COVID-19 pandemic, international doctoral students entered their programs with clear expectations that served as psychological reference points for assessing progress and success. These were both temporal and performance-based: completing the degree within a standard timeframe, engaging in face-to-face mentorship, presenting at conferences, and transitioning into academic jobs or permanent residency in the host country. These aspirations reflected broader norms of doctoral socialization and were reinforced by students' prior academic achievements, long-term migration goals, and considerable emotional and financial investments (Abdul-Rahaman, 2023; Donohue et al., 2021; Pyhältö et al., 2023a).

Across contexts, these reference points were remarkably consistent. In the U.S., Wang and DeLaquil (2020) described the “ideal” doctoral journey as rooted in in-person mentorship and academic community. Australian students expected structured timelines and post-study employment opportunities (Gomes, 2022), while candidates in the UK and Sweden planned around milestones like fieldwork, thesis submission, and job applications (Börgeson et al., 2021; Jackman et al., 2022). In Canada, Y. Xu (2022) reflected on aspirations shaped by past academic success and imagined transnational mobility. In Finland, students anticipated regular supervision, lab access, and networking opportunities (Pyhältö et al., 2023a, 2023b). Even in cross-national studies, expectations of timely completion, professional development, and academic advancement were common (X. Xu & Tran, 2022).

The pandemic upended these expectations. With universities closing and research activities stalled, the baselines doctoral students had once used to gauge success no longer aligned with reality. Disruptions to lab access, field sites, and participant recruitment led many to delay milestones and lower productivity goals (Börgeson et al., 2021; Donohue et al., 2021). These shifts were especially difficult for those mid-dissertations, whose progress hinged on continued data collection (Pyhältö et al., 2023a). In the UK, some were forced to redesign their projects without extended funding or faced joblessness at critical transition points (Jackman et al., 2022). In New Zealand, 60.6% of doctoral graduates revised their career plans, with 19.2% losing confirmed job or postdoc offers (Spronken-Smith et al., 2023).

For international doctoral students, the breakdown of reference points was more acute. Travel restrictions, visa complications, and disconnection from home and host countries intensified the disruption. International graduates in New Zealand faced disproportionate challenges due to border closures and limited mobility (Spronken-Smith et al., 2023), while many students stranded abroad had to rethink expectations for conducting research or securing employment overseas (Phan et al., 2025). X. Xu and Tran (2022) observed how Chinese doctoral students navigated a “ripple effect” of disruptions by recalibrating their goals, accepting delayed graduation, or altered career plans. For those on temporary visas, unmet timelines threatened legal residency, making academic progress an immigration necessity as well as a personal aim (Covington & Jordan, 2022; Donohue et al., 2021). Gomes (2022) described this collapse of linear trajectories as “shock temporality,” leaving students suspended in uncertainty, disconnected from institutional and academic life.

In response, many students redefined their reference points around feasibility rather than excellence. Previously assumed benchmarks, like uninterrupted productivity or on-time graduation, gave way to more flexible goals, such as staying enrolled, maintaining mental health, or continuing academic work under constrained conditions (Alsunaydi, 2021; Wang & DeLaquil, 2020). Students increasingly viewed success not in terms of competitive outcomes but in terms of resilience, stability, and survival (Gomes, 2022; Phan et al., 2025). As Y. Xu (2022) noted, even short-term achievements like writing from home or staying connected with family became meaningful replacements for pre-pandemic aspirations.

Importantly, these recalibrations varied across personal and national contexts. Chinese students in the UK faced a “double bind” between returning home for safety and staying to complete their studies (Zhang et al., 2022). In the U.S., Alsunaydi (2021), a Saudi doctoral student and mother, struggled

to reconcile expectations of quiet research time and institutional childcare support with intensified domestic responsibilities. In Sweden, biomedical PhD students expressed dissatisfaction when supervisor contact and lab access fell short of pre-pandemic norms (Börgeson et al., 2021). Similarly, in a U.S. social work program, international doctoral students were forced to revise their expectations when fieldwork and funding opportunities collapsed (King & Dahal, 2022).

To summarize, COVID-19 destabilized the normative benchmarks of doctoral education. Yet the forced recalibration also revealed the contingent and adaptive nature of reference points in career development. Students across contexts redefined what success meant amid disruption, negotiating new baselines to restore a sense of direction and agency in uncertain times.

LOSS AVERSION: HOLDING ON IN TIMES OF CRISIS

A central concept in prospect theory is loss aversion: the idea that people feel the pain of losses more intensely than the satisfaction of equivalent gains. This tendency was evident in international doctoral students' responses to the COVID-19 pandemic. Confronted with threats to their academic progress, legal status, and career prospects, many prioritized avoiding losses over pursuing new opportunities. Rather than seeking advancement, students focused on preserving what they already had – academic standing, visa eligibility, funding, and emotional well-being (Donohue et al., 2021; Phan et al., 2025).

The perceived losses were wide-ranging and deeply personal. Doctoral students feared falling behind on research milestones, missing critical networking opportunities, and failing to complete their degrees on time. These concerns often outweighed any benefits associated with pandemic-related flexibility, such as working from home or having a looser schedule (Alsunaydi, 2021; Börgeson et al., 2021). In Sweden, students expressed distress over diminished supervision and lost lab access – issues that felt more significant than the gains of remote work (Börgeson et al., 2021). In the U.S., doctoral students grieved the erosion of scholarly communities and professional visibility through missed conferences and delayed publications (Covington & Jordan, 2022; Donohue et al., 2021).

For international doctoral students, these losses were magnified by the fragility of their legal and institutional status. Many faced the risk of visa expiration if they could not graduate or secure employment on time (King & Dahal, 2022; Zhang et al., 2022). In response, students extended enrollment, accepted temporary work, or returned home, not out of preference but to avoid more catastrophic losses like deportation or joblessness (Spronken-Smith et al., 2023). Zhang et al. (2022) reported that some Chinese students compromised on their long-term plans by returning to China simply to preserve short-term stability.

Loss aversion also shaped how students revised their career plans. With hiring freezes and rescinded offers, many quickly pivoted to non-academic jobs or stopgap positions to avoid unemployment (Spronken-Smith et al., 2023). Others enrolled in any available academic program to retain legal residency and institutional affiliation, which were essential to maintaining housing, healthcare, and professional networks (Abdul-Rahaman, 2023).

The emotional toll of these perceived and actual losses was profound. Y. Xu (2022) wrote of mourning the loss of in-person collaboration and cultural connection, while others reported debilitating anxiety and grief caused by academic isolation and disrupted support systems (Gomes, 2022; X. Xu & Tran, 2022). For many, the fear of wasting time or disappointing family, especially among Asian international students, amplified the emotional stakes of interrupted progress (Phan et al., 2025).

To avoid further losses, students actively adapted their routines and expectations. Many made conscious efforts to maintain academic momentum and emotional balance, such as delaying milestones, adjusting goals, and seeking alternative forms of support (X. Xu & Tran, 2022). For instance, Y. Xu (2022) temporarily stepped back from research, reframed her long-term ambitions, and found emotional grounding in cultural practices like cooking familiar meals. These strategies reflected not only resilience, but a loss-averse mindset focused on preventing further academic or emotional unraveling.

To summarize, international doctoral students felt the weight of loss more intensely than the potential of gain. Their pandemic responses were shaped by a determination to protect what they had – degrees in progress, immigration status, professional identity – even as those foundations were threatened by prolonged disruption. While institutional accommodations offered some support, they rarely counterbalanced the personal and professional costs students experienced.

RISK-SEEKING UNDER UNCERTAINTY: NAVIGATING UNCHARTED PATHS

A key insight from prospect theory is that when individuals face high uncertainty in the domain of losses, they may become risk-seeking, willing to pursue uncertain or unconventional paths to avoid a guaranteed loss. During the COVID-19 pandemic, international doctoral students found themselves in precisely such a position. Confronted with stalled research, disrupted timelines, precarious visa conditions, and a collapsing academic job market, many exhibited risk-seeking behaviors in their academic, professional, and personal decision-making.

This tendency manifested in a wide array of bold and often unconventional actions. In the absence of institutional clarity and with long-term plans in flux, some students redesigned research projects mid-way, shifted topics, or launched new collaborations without the usual scaffolding of in-person support (Jackman et al., 2022; X. Xu & Tran, 2022). Others initiated interdisciplinary or virtual research partnerships, embracing uncertainty in hopes of salvaging momentum (Donohue et al., 2021). For biomedical doctoral students in Sweden, risk-seeking took the form of negotiating program extensions, requesting adjustments to degree requirements, or even continuing lab work despite health concerns (Börgeson et al., 2021).

Career-related risks were equally prominent. Faced with vanishing academic prospects, students across the globe pivoted toward unfamiliar or non-traditional career paths. These included launching entrepreneurial ventures, pursuing advocacy work, or retraining in new sectors such as nursing and business (Spronken-Smith et al., 2023; Y. Xu, 2022; Zhang et al., 2022). In Australia, students altered visa pathways or applied for temporary work visas in unrelated fields, viewing these actions as last-resort strategies to preserve their long-term aspirations (Gomes, 2022; Phan et al., 2025). Others accepted short-term or insecure job offers, returned to their home countries without guaranteed employment, or took work below their qualification level (Abdul-Rahaman, 2023; Covington & Jordan, 2022).

Notably, these decisions were not always framed by students as “risky”; rather, they were calculated responses to a shifting landscape in which previous benchmarks had lost relevance. For many, risk-seeking became a means of regaining control amid chaos – an attempt to build new pathways when old ones had closed. Whether choosing to stay abroad despite job insecurity (Zhang et al., 2022), starting over in a new discipline (Spronken-Smith et al., 2023), or embracing remote data collection to meet dissertation deadlines (Abdul-Rahaman, 2023), international doctoral students’ responses illustrate the core logic of prospect theory: when faced with inevitable loss, individuals often choose the uncertain gamble over certain failure.

It is also important to note that risk-seeking does not characterize every student. Many remained risk-averse, constrained by visa limitations, financial insecurity, or family obligations that made bold decisions untenable. Still, the literature highlights that under the extreme uncertainty of COVID-19, previously rare or extreme decisions became more common as students sought to forge a path forward. The notion of “agency as struggle and resistance” captures how students actively fought against dire prospects (Phan et al., 2025). For example, those stranded away from their labs exhibited agency by finding ways to continue research remotely, effectively risking lower-quality outcomes but refusing to accept a total academic paralysis.

To summarize, the willingness of international doctoral students to diverge from normative academic trajectories during the pandemic underscores a key insight of prospect theory. Under high uncertainty and perceived loss, people do not passively endure; they recalculate, adapt, and sometimes

gamble on the unknown. Across these dilemmas, some students took calculated risks in their academic and career decisions, while others remained cautious, each reflecting how they framed their situation in a world turned uncertain.

DIMINISHING SENSITIVITY: ADAPTATION IN THE FACE OF PROLONGED DISRUPTION

Diminishing sensitivity, a core principle of prospect theory, suggests that as individuals experience repeated or prolonged exposure to similar stimuli, their emotional responsiveness to each new instance tends to decrease. Applied to international doctoral education during the COVID-19 pandemic, this concept captures how students' initial distress gradually gave way to pragmatic adaptation.

Early in the pandemic, students reported intense emotional responses to sudden cancellations, border closures, and derailed academic plans: "I was anxious because I didn't know when the border would open. It was hard to focus on studying at home" (Phan et al., 2025); "It was a lot of anxiety, a lot of fear, because I do not have a social support system here" (King & Dahal, 2022); and "I am very concerned that my potential participants ... will be discouraged from participating in my study due to the circumstances of the 2020-2021 school year, which are a direct result of the pandemic" (Donohue et al., 2021).

Over time, however, these sharp reactions began to plateau. Wang and DeLaquil (2020) documented a shift from lamenting lost opportunities to implementing adaptive practices, such as virtual peer writing groups and redefined progress goals. Similarly, Alsunaydi (2021) described her transition from early-stage chaos to more stable emotional regulation through structured routines and monthly virtual check-ins. In Sweden, biomedical doctoral students adjusted to frequent online supervision and altered project timelines. Once routines were stabilized, additional disruptions had less psychological impact (Börgeson et al., 2021).

In the United States, doctoral students initially overwhelmed by teaching burdens, caregiving, and digital isolation gradually rebuilt structure through flexible planning, informal peer support, and adjusted academic goals. As disruptions continued, the emotional salience of each setback – missed deadlines, delayed defenses, or canceled conferences – diminished as students reoriented their expectations (Covington & Jordan, 2022; Donohue et al., 2021). Social work students, for instance, found meaning in small successes like completing virtual interviews or adjusting career aspirations to accommodate family life (King & Dahal, 2022).

This adaptive trajectory was echoed globally. In Australia, international students adopted daily coping routines such as journaling, prayer, and exercise, finding that while new disruptions still caused stress, their emotional intensity softened with time (Gomes, 2022; Phan et al., 2025). In the UK, distress over canceled fieldwork and conferences gradually gave way to renewed focus on writing and solo tasks (Jackman et al., 2022). Similarly, in Malaysia and New Zealand, students who initially panicked over job losses or stalled research came to accept alternatives like retraining, part-time work, or reduced ambitions with less emotional resistance (Abdul-Rahaman, 2023; Spronken-Smith et al., 2023).

Students' responses also reflected a shift in emotional investment. Small victories like completing a dissertation chapter or securing part-time work took on greater emotional weight, while once high-stakes losses like postponed fieldwork or missed job opportunities became less central to their sense of success (Phan et al., 2025). Reflecting on her extended separation from China, Y. Xu (2022) noted how the pain of border closures eventually gave way to emotional numbness, becoming a normalized part of her diasporic identity. Likewise, Zhang et al. (2022) observed that Chinese doctoral students in the UK grew emotionally detached from earlier career aspirations as job market barriers persisted.

This process of diminishing sensitivity, however, was neither uniform nor inevitable. In Finland, mid-stage doctoral candidates reported increasing emotional strain as the pandemic wore on, suggesting that the burden of prolonged uncertainty could accumulate over time, especially for students with

limited coping reserves (Pyhältö et al., 2023a). Part-time candidates or those in more remote-compatible disciplines like the humanities reported fewer disruptions and adapted more readily (Pyhältö et al., 2023b). Moreover, chronic visa uncertainty and the absence of family support for many international doctoral students continued to generate emotional weight, showing that some stressors retained their intensity regardless of duration (Abdul-Rahaman, 2023).

To summarize, while the early stages of the pandemic provoked acute distress and disorientation, many international doctoral students exhibited a trajectory of diminishing sensitivity. Later disruptions triggered less emotional upheaval than earlier ones, and students gradually recalibrated both their expectations and strategies for navigating academic life. However, this shift did not diminish the severity of their challenges, highlighting their capacity to adapt by reshaping routines, redefining goals, and revising their metrics of success.

IMPLICATIONS

The COVID-19 pandemic presented an unprecedented disruption to international doctoral students' academic and career trajectories. This review, guided by prospect theory, has examined how students framed decisions under uncertainty and adapted to prolonged disruption. The findings not only illuminate the cognitive and emotional processes shaping career choices during crisis but also offer actionable insights for theory, practice, and future research.

IMPLICATIONS FOR THEORY

This review contributes to theoretical understandings of doctoral education and career development in three ways. First, it offers a nuanced understanding of international doctoral students' career decision-making during periods of crisis and uncertainty – a dimension largely underexplored in existing literature. Most theories of doctoral development and academic career planning presume relatively stable conditions (Savickas et al., 2009; Wehmeyer et al., 2019), yet the pandemic revealed how profoundly unexpected disruptions can reshape students' trajectories. By centering decision-making under the pandemic, this review highlights the need to theorize how crises disrupt expectations, intensify constraints, and prompt recalibration of goals, particularly for students navigating cross-border systems of education, labor, and migration.

Second, this review demonstrates the value of behavioral economics frameworks in unpacking doctoral career decision-making, not only during crises but also in the context of enduring structural uncertainty. The four key constructs of prospect theory offer distinct insights. Reference points help explain how students assessed the impact of disruptions relative to pre-pandemic expectations. Loss aversion captures the prioritization of avoiding setbacks over taking uncertain opportunities. Diminishing sensitivity clarifies how students' emotional reactions lessened over time, as they adjusted to ongoing adversity. Risk-seeking under uncertainty helps explain why some students made bold or unconventional career choices, as their circumstances positioned inaction as the greater risk. This prospect theory analysis moves beyond rational-choice or trait-based explanations of career behavior, providing a dynamic framework to understand how cognitive and emotional evaluations interact with institutional and geopolitical constraints.

Third, the findings challenge prevailing assumptions in career development and doctoral socialization theory. Career development has traditionally been viewed as a linear, individualized pursuit centered on academic and professional success (Baruch, 2004; Vande Griend et al., 2020). However, the pandemic revealed how decisions were shaped by broader life contexts, including family obligations, mental health, and immigration pressures. This calls for a more expansive definition of doctoral "success" that includes psychological well-being, relational dimensions, and adaptive responses to structural uncertainty. Furthermore, the findings highlight that doctoral socialization is not solely about academic integration but also about navigating uncertainty, building resilience, and making meaning in various contexts (Blockett et al., 2016; Hou, 2024).

IMPLICATIONS FOR PRACTICE

Applying prospect theory to the analysis of student decision-making underscores the importance of understanding not only structural barriers but also the cognitive and emotional dynamics that shape students' experiences during crises. Stakeholders at multiple levels can draw on these insights to design more responsive and empathetic support systems.

For universities, the disruption of students' reference points highlights the need for institutional policies that are transparent, flexible, and sensitive to international students' unique circumstances. Institutions must recognize the global interdependence of research training systems, especially for students who straddle multiple national regimes. During the pandemic, many students found themselves unable to complete research or travel due to factors beyond their control. Universities should therefore develop contingency plans for future crises that include equitable extensions of funding, clearer communication about visa implications, and support for restructured research designs (Abdul-Rahaman, 2023; Levine et al., 2021). Institutions must also consider that "success" during and after crisis periods may not align with traditional benchmarks of productivity or publication; inclusive policies must recognize that international students may need alternative paths to completion and professional integration.

Program directors play a critical role in mediating between institutional policies and student experiences. This review suggests that many students made loss-averse decisions to preserve progress and legal status, often at great personal cost. Program directors should proactively work to reduce the perceived and actual losses students face during disruption by offering flexible timelines, emergency funding, and emotional support (Fu et al., 2022). Syropoulos et al. (2021) suggest that when graduate students feel supported during crises such as the COVID-19 pandemic, they report higher levels of optimism. This outlook can bolster resilience in challenging circumstances. Building on this, program directors could help students frame their career decisions more positively, even under uncertainty. This could involve expanding definitions of success beyond academic job placements (Skakni et al., 2022) and creating space for open discussions about diverse career pathways, including industry, public service, and international options.

Supervisors or mentors were central figures in students' adaptation to prolonged disruption, and their actions often shaped whether students felt supported or isolated (Pyhältö et al., 2023b). As students recalibrated their expectations and began to experience diminishing sensitivity to ongoing stress, the emotional tone set by supervisors mattered greatly. Supervisors should be encouraged to engage in regular, empathetic communication that goes beyond academic milestones. Understanding students' immigration constraints, caregiving responsibilities, and mental health challenges can help them set realistic goals and reduce the psychological burden of perceived failure. Additionally, supervisors can help students reframe setbacks not as personal losses but as adaptations to global conditions, which may buffer the emotional impact of unmet expectations.

IMPLICATIONS FOR RESEARCH

The pandemic is (hopefully) a once-in-a-lifetime event, but other disruptions – economic, political, environmental – will continue to shape international education. Future research should build on the lessons of COVID-19 to examine how resilient international doctoral education systems are and how outcomes can be improved.

Longitudinal studies following the cohort of doctoral students who were in the middle of their PhDs during the pandemic into their early careers would be particularly valuable. For example, do those who graduated in 2020–2022 experience slower career progression or move into different sectors compared to earlier or later cohorts? Such data can quantify the long-term impact. Qualitative studies can also explore retrospective meaning-making, asking how students interpreted their decisions during the crisis and how they make sense of those decisions over time.

Comparative research across various educational and national systems can help reveal why some institutions were better able to retain and support international PhDs. Further, subgroup-focused research is needed to examine how intersecting factors shaped students' vulnerability and adaptability during the pandemic, such as gender, caregiving responsibilities, regional origin, and field of study.

CONCLUSION

This review examines how international doctoral students navigated disrupted academic and career trajectories during the COVID-19 pandemic. Guided by prospect theory, it draws on a narrative review of 16 international peer-reviewed studies. Across four constructs – reference points, loss aversion, diminishing sensitivity, and risk-seeking behavior under uncertainty – the analysis reveals that students' decisions were shaped by comparisons to pre-pandemic expectations, strong tendencies to avoid perceived losses, adaptive recalibration of goals over time, and strategic risk-taking when conventional options narrowed.

This study offers new insights into the psychological and contextual dimensions of career decision-making in times of global crisis. These findings advance theory by demonstrating how prospect theory, typically applied to economic decision-making, can illuminate the psychological and contextual dimensions of career decision-making under global crisis conditions. They also underscore the agency of international doctoral students, who did not merely react to structural constraints but actively reframed goals, negotiated uncertainties, and made complex trade-offs under pressure.

For practice, the review highlights the need for universities, supervisors, and policymakers to design flexible systems that acknowledge shifting reference points, mitigate perceived losses, and reframe diverse career paths as valued outcomes. By recognizing emotional fatigue, supporting optimism, and balancing performance metrics with personalized mentoring and career guidance, institutions can enhance resilience among this population.

Understanding how students make decisions under uncertainty and risk is not merely valuable; it is essential to reimaging doctoral education for a more equitable and responsive future in the face of continuing instability.

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