Accommodations in the Assessment of Health Professionals at Entry-to-Practice: A Scoping Review

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Abstract

This scoping review examines the available evidence supporting accommodation use in the assessment of health professionals with disabilities in licensing contexts. While test accommodations are a protected right under antidiscrimination legislation, the peer-reviewed evidence informing their use is contested and widely dispersed. Furthermore, the ramifications of accommodation misuse are significant, including human rights violations and increased risks to patients. As such, this study addressed two research questions: 1) What is the current state of literature on accommodation use in the assessment of health professionals? and 2) What programs of research would address stakeholders' concerns about the use of accommodations in the assessment of those professionals? Systematic searches of five prominent databases identified 15 articles for analysis. Several major themes emerged from that analysis: interpreting legislation, administration and process, relationships between education and licensure, and psychometrics and test development. Stakeholder consultation revealed that stakeholders face challenges managing accommodation requests and defining reasonable accommodations. While there is a paucity of literature on the topic overall, especially of an empirical nature, this study mapped the available evidence and laid the foundation for future studies by delineating the gaps in the scholarly literature as defined by stakeholders' needs.

Keywords: accommodation, disability, health professions education, licensing, examination, scoping review

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I. Introduction to my MA Thesis by Article

I completed this MA thesis, *Accommodations in the Assessment of Health Professionals at Entry-to-Practice: A Scoping Review*, in article format. In order to contextualize my study in the broad areas of assessment and health professions licensing and to provide preface information for the article, I first present this introductory chapter. Within this chapter, I describe the problem under investigation and account for how the research problem came to be of interest to me. I also present the purpose of the study, its underlying research questions, my role and positionality as the researcher, and my reflections on the methodology used to address the research questions. I conclude this introductory chapter with a background discussion summarizing the study's key concepts. Overall, this background provides readers with greater context for the article presented in chapter two.

Description of the Study Problem and Rationale

Study Problem. The regulation of health professionals is critical to ensure that the public has access to safe and effective health care options. Mandatory entry-to-practice (ETP) exams, also referred to as certification, licensing, or board exams, are a key component of this regulation process. Examination provides assurance to regulators and the public that health professionals possess the necessary competence to practice within their chosen fields. While the design and content of these ETP exams vary by profession, it is typical for a candidate seeking entry to a health profession to undergo rigorous standardized written and performance-based exams as part of the certification process.

The development of ETP exams typically occurs with a particular exam candidate in mind: one who is fluent in written and spoken language, can interact with exam staff in a predictable manner, and can independently navigate the exam environment. Experience, however, reveals that not every candidate fits this description. Occasionally, candidates with exceptionalities apply for certification, such as candidates with physical or cognitive disabilities. Consequently, exam administrators respond to these situations by offering accommodated exams in which the accommodation aims to create an equitable testing environment, thereby enabling the candidate to demonstrate his or her competence despite exceptionalities. Colloquially, this concept "levels the playing field" for those who would otherwise be disadvantaged by the design of the exam (Meeks & Jain, 2015; Sokal & Vermette, 2017; Stretch & Osborne, 2005). Ideally, accommodations are changes or additions to the exam environment that do not alter the exam

construct (that which the exam is designed to assess). Accommodations can take many forms depending on the candidate's individual characteristics and needs. For example, they can include the presence of a sign-language interpreter, the reformatting of exam materials (e.g., enlarged font sizes), or an increase to the allotted exam time. While the benefit of the accommodation to the candidate who requests it is usually obvious, alterations to the environment made after exam development and without the consultation of exam developers has potentially negative impacts on the validity of the interpretations of scores obtained on accommodated exams (AERA, APA, & NCME, 2014; Julian, Ingersoll, Etienne, & Hilger, 2004; Kettler, 2012; Phillips, 1994; Stretch & Osborne, 2005). In turn, this can lead to the use of potentially inaccurate data to inform judgments of a candidate's competence and readiness for professional practice. In the case of ETP exams for health professions, these potential misjudgments have wider implications for public safety.

Rationale. There are a number of factors compounding the above-mentioned problem, each of which provides further rationale for study on this topic. First, the numbers of post-secondary students with disabilities is increasing (Harrison & Holmes, 2012; McCloy & DeClou, 2013; Sokal & Vermette, 2017), and based on informal correspondences with representatives from various health professions, I expect that the number of candidates requesting accommodation in licensing exams is also increasing. To meet a growing demand for accommodations in a way that is systematic and evidence-based, educational institutions and testing agencies require access to a body of literature that supports evidence-based decision-making regarding accommodation use. An evidence-based approach to accommodation is necessary to satisfy not only the needs of exam candidates with disabilities but also the concerns of other stakeholders. The challenge of assigning and implementing accommodations is arguably greater within the health professions, as the discourse surrounding accommodation use often pits students' human rights against patients' right to safety (Hargreaves & Walker, 2014; Walker, Dearnley, Hargreaves, & Walker, 2013). In this regard, empirical evidence is crucial to separate arguments based in unjust fears from those rooted in scientific research.

Second, my preliminary reviews of the scholarly literature suggested that the evidence needed to build consistent and fair health profession assessment programs related to accommodation use was dispersed and poorly characterized. There was agreement among several authors (Hinman, Peterson, & Gibbs, 2015; Krueger, 2000; Phillips, 1994; Weis, Dean,

& Osborne, 2016) that evidence-informed practices for assigning accommodations are lacking and that the implications of accommodations in certification exams are largely unknown. Compounding the problem are the significant ramifications for the misuse of accommodations, namely the violation of human rights, losses of resources for test-takers, and potential impacts on public safety when ETP exams fail to discriminate incompetent from competent candidates. Conversely, there is a loss of valuable contributions to the health sector when competent candidates are unfairly denied entry to their chosen profession due to an assessment agency's inability to adequately accommodate at ETP exams (Hargreaves, Dearnley, Walker, & Walker, 2014).

Lastly, within the context of the Canadian province of Ontario[1], ongoing changes in the legislative climate (marked by the gradual implementation of the 2005 *Accessibility for Ontarians with Disabilities Act* and the Ontario Human Rights Commission's (2016a) updated guidelines for accommodation use), have brought the issue of accommodation to the forefront of social institutions, including health professions education programs and health regulators. While the message from the Ontario government is clear—social institutions have a duty to accommodate—the process for setting accommodations, including the criteria to determine who is entitled to which accommodation, remains opaque. When educators or test administrators deny accommodation requests, that denial may infringe upon individuals' human rights, and in some cases result in legal action. Alleged discrimination against students with disabilities in post-secondary institutions has already attracted the attention of mainstream media. For example, the case *Dunkley v. University of British Columbia and St. Paul's Hospital* involving a physician-trainee who was denied sign-language interpreting during residency was widely reported (Morton, 2015). Another case, *Dhanota v. York University*, involving a graduate student's two-year battle to maintain privacy of her medical history and diagnosis while seeking accommodations, made international headlines (Gulli, 2016); and the hotly-debated *Sears v. Memorial University* involving an undergraduate student who was denied classroom accommodation by a professor claiming that the technology (an FM transmitter) required to accommodate the student impinged upon her (the professor's) religious rights (Bartlett & O'Brien, 2015). These few examples illustrate the complex and multifaceted nature of this issue,

[1] I selected Ontario for the sole purpose of situating the stakeholder consultation (Phase Two) of this study. The scoping review (Phase One) was not limited by location.

and highlight that even well-informed organizations, such as institutions of higher learning, sometimes struggle to balance the needs of all stakeholders in the process of assigning and implementing accommodations.

Objectives and Research Questions

Given the growing numbers of accommodation requests, the observed lack of resources and dispersed literature to inform accommodation decision-making, and the legal and safety implications of accommodation *mis*use, the subject is extremely topical to a wide-range of stakeholders. As such, I decided to explore accommodation use in health licensing contexts by conducting a form of literature review known as a scoping review, as described by Arksey and O'Malley (2005). The scoping review also included a consultation exercise as described by Levac, Colquhoun, and O'Brien (2010), wherein key stakeholders were surveyed using an online questionnaire to elicit feedback on the review's findings as well as stakeholders' challenges and preferred areas of research pertaining to accommodation use. The scoping review (Phase One of my study) systematically identified and characterized the available body of evidence within the scholarly literature that supports informed decision-making concerning the use of accommodations within health professions certification programs. Through the stakeholder consultation (Phase Two), I prioritized the avenues for future research initiatives so that the most pressing concerns of stakeholders involving accommodation use can be addressed. Furthermore, the consultation allowed me to delineate the gaps in the current scholarly literature based not solely on my interpretation of that literature, but on stakeholders' feedback.

I met these objectives by pursuing a study that sought to answer two research questions:

1) What is the current state of literature on accommodation use in the assessment of regulated health professionals?

2) What future programs of research would address stakeholders' concerns about the use of accommodations in the assessment of regulated health professionals?

These questions formed the foundation of my study and informed all aspects of its design, from the creation of data collection instruments to the analysis and final discussion of results.

Positionality

My interest in this topic stemmed from my personal experience of working in the field of testing and measurement. In that capacity, I encountered the challenge of delivering accommodated exams that met individual candidates' needs and maintained the standardization required for fair assessments with sufficient validity evidence. I also encountered a lack of resources within the arenas of education and certification to guide accommodation practices in high-stakes licensing exams, particularly for performance-based exams such as those used to assess clinical skills in health professions. Additionally, I have attended accommodation forums hosted by academic institutions that have included discussions on the issue of accommodation use in professional training programs. There I observed mixed attitudes amongst participants towards the acceptance of disability within professional training programs, including the health professions, and uncertainty regarding the interpretation of legislation as it pertains to licensing examinations.

In the fall of 2015, as part of my required coursework for this master's degree, I designed and conducted a qualitative pilot project to explore the experiences of deaf and hard-of-hearing health professionals in the licensing context. This project drew upon the *grounded theory* approach to qualitative inquiry developed by contemporary grounded theorist, Kathy Charmaz. Her writing on constructivism in research (2014) made a lasting impression on me, and influenced my approach to this thesis, despite it being a scoping review and not a grounded theory study. The constructivist approach, as described by Charmaz (2014), emphasizes the fluid nature of the research process, mirroring the very iterative nature of the scoping review methodology. The constructivist approach also recognizes that researchers act under specific conditions, both known and unknown. The constructivist approach acknowledges the subjectivity inherent in the research process and the role of the researcher in the construction (rather than the discovery) of the research data, analysis, and findings.

The constructivist lens relates closely with my ontological position that embraces the concept of multiple realities (even when these realities seemingly contradict one another). Axiologically, I value human diversity, and as such, it is my belief that individuals with disabilities deserve fair access to professional careers and that the gatekeepers to these professions must act responsibly to remove unjust barriers and to correct discriminatory practices. This stance aligns with disability theory and the social model of disability wherein

individuals view disability as human difference and not as defect (Creswell, 2013; Oliver, 2013). Within my writing, I have deliberately adopted the use of the first-person to make explicit my role as the principal investigator and to remind readers of my influence over each aspect of the study's design. Despite having closely followed a prescribed method for conducting scoping reviews, I recognize it is my interpretation of that method, combined with much decision-making throughout the process, that subtly influenced the outcomes of this study.

Methodological Reflections

There are several reasons why a scoping review was well-suited to my topic. For one, the methodology examines the range and nature of research activity in a particular field, especially when those activities are only beginning to emerge and systematic reviews of the subject are not yet viable. Scoping reviews also aim to summarize and disseminate research findings, identify research gaps, and evaluate the need for future research (Arksey & O'Malley, 2005). In addition, the findings of scoping reviews may also inform practice and policymaking (Daudt, vanMossel, & Scott, 2013). Each of these aims aligned with my overall research goals and study objectives. Having come to my researcher role with personal experience in the field of testing and measurement, I wanted to conduct a study that not only sparked interest amongst stakeholders, but also potentially influenced their practices and policies in a meaningful way.

The six stages of the scoping review framework as described by Arksey and O'Malley (2005) and Levac, Colquhoun, and O'Brien (2010) involve identifying the research question(s), designing a search strategy, screening and selecting relevant studies, charting or extracting the data, analyzing and reporting the results, and designing and conducting the stakeholder consultation. I describe each of these stages in the following manuscript (see pages 25-28). Thus, in this introductory chapter, I offer insights into the major decisions and challenges that arose at each of these steps.

Stage I: Identifying the Research Questions

My study revolved around two research questions. The first related directly to the literature search (Phase One) and the second related directly to the stakeholder consultation (Phase Two). Levac et al. (2010) caution that research questions must be comprehensive to avoid missing relevant evidence, and that the concepts within those questions be well-defined to inform later stages of the review. As such, I carefully considered each term or phrase comprising my two questions. The "state of academic literature" in the first question is adequately broad to

include mapping a range of publication styles while imposing some limitation on where those publications are sourced (i.e., scholarly journals). The term "accommodation" captures a range of alterations or additions to an "assessment" which refers to any form of testing (including written and performance-based examinations) at the time of "entry-to-practice" (i.e., certification or licensing examinations). The "health professionals" have been defined as the 26 health professions regulated within the Canadian province of Ontario (see Table 3 in Chapter 2), as specified by Schedule 1 of the *Regulated Health Professions Act* (1991). While the scoping review was not limited to Ontario (or even Canada), the adoption of this definition of health professionals was necessary to limit the number of professions included in the review's lengthy list of search terms (further described in Stage II). It also provided context for the identification of a manageable stakeholder population (further described in Stage VI) as referenced in the second research question. Subsequently, the stakeholder population fell into three distinct groups: exam administrators, regulators, and the corresponding authors of those articles identified for inclusion within Phase One of the study.

Stage II: Identifying Relevant Studies

I initially conducted my search strategy with the intention of including supplemental literature (as prescribed by the traditional scoping review methodology). As my study progressed, however, it became clear to me to exclude the supplemental and grey literature for four reasons. First, there were no clear boundaries of what constituted this "literature"; my searches were turning up policies, reports, textbooks, videos, slideshows, newspaper articles, etc., which were too varied for one synthesis or contained materials which were not publicly available (due to the security concerns of testing agencies). Second, the grey literature did not align with my particular research question that sought to discover the *evidence* supporting accommodation use; as a general rule, grey literature doesn't qualify as evidence given its lack of peer-review process and scholarship. Third, I was lacking models of how to manage the data extraction and analysis of the diffused grey literature since the published scoping reviews that I consulted in health care did not include grey literature. Lastly, given that I was conducting a stakeholder consultation, I thought it best to inquire with stakeholders as to the resources (i.e., grey literature) that they use to inform their practices (as such, this became one item within my stakeholder questionnaire). While most of the supplemental searching that I conducted revealed material too varied for synthesis, the search did turn up three texts that proved useful as

background reading and enriched the context for my study's discussion. Those texts included the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014), chapter five of Meeks and Jains' (2016) *The Guide to Assisting Students with Disabilities* titled "The process of requesting accommodations on certification, licensing, and board exams: assisting students through the application," and several chapters from the text *Assessing Deaf Adults: Critical Issues in Testing and Evaluation*, edited by Mounty and Martin (2005).

Stage III: Screening and Study Selection

This stage of the study was relatively straightforward at its onset. Once I had conducted the searches in the appropriate databases (I consulted a health sciences librarian at this step to peer review my electronic search strategy, a process known as PRESS[2]), screening at the level of title and abstract was surprisingly quick. I recruited a secondary screener[3] for this stage of the screening process and we excluded any study that was easily identifiable as unrelated to my topic. We carried forward any study that could possibly be relevant to the analysis into the next round of screening. At this point, full-text screening, the process became more complex and time consuming. Despite having created clear inclusion and exclusion criteria to guide the screening process (see Table 2 in Chapter 2), I found myself second-guessing my decision-making over the course of the screening period. Articles that looked relevant at the beginning of the process somehow looked inappropriate by the end (and vice versa). This resulted in several rounds of full-text screening before I was confident in my final selection of articles. The use of a secondary screener at this stage was critical and multiple conversations with this reviewer were required to clarify the inclusion criteria so that I maintained consistency throughout the selection process. Another challenge that I encountered at this stage of the review was that many of the articles I was screening focused on classroom accommodations in health professions education and only contained subsections of text relevant to licensing. I made decisions about how much licensing content was necessary for an article to meet inclusion. In the end, there were articles that moved back and forth between inclusion and exclusion because of this issue. I consulted with my secondary screener to assist me in making these decisions.

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[2] Peer review of electronic search strategies, or PRESS, is a recognized process to enhance the quality of systematic literature reviews developed by the Canadian Agency for Drugs & Technologies in Health (CADTH).

[3] I selected a secondary screener who was a health professional with experience in designing and administering ETP examinations. I trained the screener in the inclusion and exclusion criteria.

Stage IV: Charting the Data (Extraction)

Like the previous stage, data extraction was an iterative process that changed as I gained familiarity with the studies. The data extraction table (presented in Table 4 of Chapter 2) underwent several revisions before it was useful to appropriately capture or map the contents of the literature. This means that I did not extract some concepts, like accommodation, because as it turned out, researchers were not writing articles that revolved around specific accommodations. Conversely, I later added other concepts, like disability, to the data extraction table given that many articles focused on exam candidates with particular disabilities. Extracting data according to the themes present in the literature proved a more difficult matter, as this process required simultaneous analysis and data extraction. I further describe this process in the following section.

Stage V: Analyzing and Reporting the Results

Preparing and reporting the numerical summary, a common feature of scoping reviews, was relatively straightforward. Reporting the thematic analysis, however, was much more complex. The thematic construction was similar to a qualitative content analysis wherein I noted prominent or recurring conversations or discussions occurring across the small body of literature included in my review. I then collapsed related conversations together to form broader categories. Finally, I combined these categories into seven themes (four major and three minor). Like the previous two stages, screening and charting, the thematic analysis proved to be an iterative process that involved moving back and forth between the emerging themes and the literature to ensure that I had identified and captured all concepts related to my research questions.

Stage VI: Stakeholder Consultation (Phase Two)

As previously stated, one of my study goals was to spark interest amongst stakeholders and influence accommodation practices in health licensing programs. To engage stakeholders in this way, I adopted the methodological framework of scoping reviews defined by Levac et al. (2010) which includes a compulsory consultation exercise. For my study, this consultation involved surveying key stakeholders (using an online questionnaire) to enhance and validate the findings of my review by asking stakeholders to comment on the relevance of the key discussions in the literature. I also used the consultation to delineate the gaps in the body of literature by asking stakeholders about their challenges and research needs. Lastly, the

consultation allowed me to recommend future programs of research by requesting stakeholders to rate the importance of various research avenues and to share their specific research questions.

Defining my participant population (i.e., stakeholders) took careful consideration. As previously mentioned, I ultimately relied on Ontario's *Regulated Health Professions Act* (1991) which governs 26 health professions to inform my selection of stakeholders. By adopting this group of professions, I could then limit my study to 26 easily identifiable regulatory bodies and the 28 testing agencies responsible for those same professions' ETP examinations. Unlike the regulatory bodies that were all Ontario-based, the testing agencies were either provincial or national, depending on the regulatory structure of the profession. In a few professions, the testing agency was a department within the regulatory body, in the case that the profession was not regulated across all provinces and so no national testing agency existed. There were two more testing agencies than regulators since the profession of medicine involves three separate assessment agencies: the Medical Council of Canada, the Royal College of Physicians and Surgeons of Canada, and the College of Family Physicians of Canada. The last and most difficult stakeholder group to define was the educators. Since reaching out to all educators across Ontario for 26 different professions was not possible, I settled on the educators/authors who had published on my topic: this group was identifiable as the corresponding authors from the articles included in my review (Phase One). There is another key stakeholder group comprised of the health professionals with disabilities who underwent ETP exams with accommodations that unfortunately could not be included in my consultation due to reasons of feasibility. The primary barrier for not including them was that there is no known means to identify or recruit this population.

The data collection tool used for the consultation, an eight-question survey composed of both closed and open-ended items, underwent many revisions before distribution. I carefully designed each survey item to align with the study's aims and objectives, in order to answer my research questions. I have included a table of specifications in the article that shows the alignment between the research questions and the survey items (see Appendix C in Chapter 2). Prior to distributing the survey to stakeholders, I piloted the survey with 10 colleagues who were ineligible to participate in the study but who had knowledge of survey design or accommodation use. I used the feedback from the pilot to improve the tool's comprehensiveness and readability.

Study Background

Before conducting my scoping review, I prepared myself by first exploring some of the peer-reviewed and grey literature relevant to the major concepts represented within my research questions. This exploration increased my awareness of health professions regulation and education, health professions assessment and accommodations, the major concepts in disability studies, and the foundational properties of psychometrics. The knowledge I gained from this preliminary review allowed me to better define the key concepts within my study. It resulted in the creation of a more focused yet thorough search strategy and facilitated my understanding and analysis of the search results. The preliminary review was also instrumental in the identification of two of my stakeholder groups (regulators and testing agencies). I present a summarized version of the preliminary review here to provider greater context for the scoping review manuscript that follows.

Health Professions Regulation

The first area I explored was health professions regulation. Regulation, also known as licensing in some contexts, refers to a legislative framework that governs the provision of health care in a given jurisdiction, and is an important facet to my study given that health regulators set the entrance criteria for professional membership and grant (or deny) licencing to candidates. Within Ontario, the health regulatory framework is overseen by the Ministry of Health and Long-Term Care (MOHLTC). Among its many duties, the MOHLTC is responsible for the administration of the *Regulated Health Professions Act* (1991) and its profession-specific statutes or acts (e.g., *Medicine Act, 1991*). These various acts sanction the establishment of 26 profession-specific regulatory bodies called colleges (e.g., College of Physicians and Surgeons of Ontario). Regulatory colleges, not to be confused with educational colleges, govern their registrants (i.e., health professionals) in the public's interest to ensure that patient care is delivered in a safe, ethical, and professional manner. Regulatory colleges perform many duties in efforts to protect the public, including setting educational and other requirements for its registrants, enforcing professional practice standards, conducting investigations of complaints, and, if necessary, holding disciplinary hearings and enforcing revocations or suspensions of practitioners' licenses (Ontario Health Regulators, 2017). For some health professions (e.g., chiropody, denturism, kinesiology), the regulatory college also administers the ETP examination required for registration, as opposed to other professions (e.g., physiotherapy, pharmacy,

medicine) whose ETP examinations are administered by national arm's-length assessment agencies.

Health Professions Education

Like all post-secondary education programs in Ontario, health professions programs are approved through the Ministry of Advanced Education and Skills Development or the Superintendent of Private Career Colleges, not by the MOHLTC or its heath regulatory colleges. Depending on the discipline, training may be offered in university, private career college, or community college settings. Within Ontario, these institutions have a duty to accommodate individuals with disabilities (Ontario Human Rights Commission, 2016b). In many cases, institutions have created specialized accessibility offices to support students with disabilities or complex learning needs. Health profession training programs differ in scope and depth according to the discipline, but typically include academic portions (e.g., clinical sciences, treatment approaches, jurisprudence) as well as practical or hands-on training (e.g., clinical skills, field placements, residencies). As previously mentioned, graduation from these institutions does not in itself qualify one to practice within a profession: successful completion of an ETP exam, among other prerequisites set by the regulator, is necessary to gain licensure.

Currently, health professions education is undergoing a shift from credential- or time-based models of education to competency-based models (Gruppen, Mangrulkar, & Kolars, 2012). Competency-based education (CBE) is designed to focus on the desired performance characteristics (i.e., competencies) of health professions learners and is paced according to the individual learner's attainment of those characteristics. The CBE model is built upon a competency profile that outlines the practice competencies (and their performance indicators) that the profession deems necessary to perform in the field. Expressed differently, competency profiles outline the minimum level of knowledge, skills, and attributes required to practice safely. Competency profiles inform more than curricula design. They may also inform the development of content outlines or blueprints for the profession's ETP examinations. This point is important to my study as the particular language of competency profiles (and test blueprints) is sometimes considered when determining the suitability of a particular exam accommodation and how that accommodation might impact the construct of the exam.

Disability

Within my study, disability is the grounds upon which my population of interest seeks academic accommodation (in contrast to accommodations sought on grounds of religion, family status, language, etc.). The term *disability* represents a range of human characteristics, whether permanent, temporary, or episodic, and affects as many as one in seven Canadians (Government of Canada, 2013). Disabilities are not necessarily fixed: some may worsen, remain the same, or improve over time or with treatment. Within the context of accommodation use, this variability results in changing accommodation needs over time. While writing about disabilities, I encountered challenges given the inconsistent use of disability-related terminology between governmental, medical, and academic or social institutions. The variation in preferred terminology can even exist between individuals with the same disability. For example, some members of the Deaf community reject the term disability to describe their loss of hearing, preferring to self-identify as members of a cultural minority (Shakespeare, Iezzoni, & Groce, 2009). For the purpose of my study, I adopted the use of person-first language (Hutcheon & Wolbring, 2012) which recognizes individuals with disabilities first as people and not as their condition or diagnosis (Shakespeare et al., 2009), such that *disabled health professionals* becomes *health professionals with disabilities*.

Models of Disability

Discussing disability is further complicated by conflicting models of disability. These include the medical model (a somewhat antiquated yet persistent model) that positions disability as an inherent defect within the individual (Shakespeare et al., 2009); the social model (Oliver, 2013) that views disability as a natural and expected variation within human nature; and the biopsychosocial model (WHO, 2002) that integrates aspects of both models and emerged in part as a response to criticisms of the previous two models. While the biopsychosocial model of disability is now favoured by some authors over the antiquated medical model, for many it has not replaced the social model as the preferred lens through which disability is viewed (Shakespeare, Watson, & Alghaib, 2017). In reference to my study, the social model of disability aligns closely with the principles that support accommodation use, specifically that barriers to participation and access lie in the external environment and not the individual.

Disability in Higher Education

The Higher Education Quality Council of Ontario observed steady climbs in the numbers of students with disabilities enrolling in and graduating from Ontario post-secondary schools over recent years (McCloy & DeClou, 2013), a trend that has also been reported in other jurisdictions (Bevan, 2014; Harrison & Holmes, 2012; Stretch & Osborne, 2005). Within Ontario, recent legislative changes meant to foster greater inclusion and full participation of students with disabilities will likely result in even greater numbers of students with disabilities pursuing post-secondary education (including health professions programs) than had been previously reported. Another reason for these increases may be that early detection of disabilities, combined with effective treatment and special education initiatives including academic accommodations, allows for greater numbers of students with disabilities to succeed in elementary and secondary school and pursue higher education.

Disability in the Health Professions

Through my background exploration, I discovered that the numbers of health practitioners with disabilities currently in practice is unknown. Neither regulators nor professional associations collect such information from its members, despite that knowing these numbers could raise awareness of the needs of professionals with disabilities and enable regulators to more closely monitor and support membership with diverse needs. Furthermore, tracking disability prevalence among professionals could facilitate members of the public with disabilities in finding professionals who can relate directly to their experiences (e.g., patients who are deaf could access care from physicians who are also deaf, thus eliminating the need for language interpreters). Many authors insist that diversifying the health professions by reducing barriers and welcoming students with disabilities will result in a professional workforce that better reflects the diversity of our society and improves upon the quality and delivery of patient care (Dearnley, Elliot, Hargreaves, Morris, Walker, Walker, & Arnold, 2010).

Visibility and Disclosure

Another aspect of disability relevant to my study, and to accommodation use generally, is the degree to which a disability is visible or evident to others. The need for accommodation is more easily understood (and accepted) for visible disabilities (e.g., it is clear to most people that a ramp is fair and justified for someone who depends on a wheelchair for mobility). However, for invisible or non-evident disabilities (e.g., a learning disability) additional explanation or

justification to access accommodations is often required. The degree to which a disability is evident may impact an individual's experience of discrimination when requesting accommodation. This impact goes both ways: an individual may be denied accommodation (or struggle to obtain it) because his or her disability is not evident to others, while an individual whose disability is more evident might face discrimination in the form of ableism. In this regard, visibility relates closely to the issue of disclosure. Those with visible disabilities have no choice but to disclose their condition, whereas those with invisible disabilities must choose when, how much, and to whom to disclose. An article by Stanley, Ridley, Harris, and Manthorpe (2011) described disclosure as a "risky process" for health professions students: many individuals fear discrimination upon revealing their disability, yet disclosure is necessary to gain access to disability services (e.g., accommodations) in academic settings. Interestingly, within Ontario, laws have recently changed to allow for the assignment of accommodations within education programs based strictly on expert recommendations (Ontario Human Rights Commission, 2016a). This change protects an individual's right to privacy in that accommodation request processes can no longer require disclosure of the applicant's diagnosis or health history. The problem with this law is that there is disagreement about which experts are qualified to make accommodation recommendations (Weis et al., 2016). Unfortunately, this change also makes tracking of the reasons for accommodation use in higher education nearly impossible. It is not yet clear how (or if) these provincial laws apply to national testing agencies who balance accommodation requests from candidates within different jurisdictions that may not be bound by the same statutory requirements.

Accommodation

Accommodations in testing include any additions or alterations to the exam materials or the exam environment that do not alter the exam construct. Ideally, these changes remove sources of measurement error created by the disability and result in more valid test scores for the candidate (Fuchs, Fuchs, Eaton, & Hamlett, 2000). As previously mentioned, the accommodation levels the playing field for individuals whose personal characteristics prevent them from accessing or fully participating in the examination under standard conditions (Meeks & Jain, 2015; Stretch & Osborne, 2005). While there is a seemingly limitless range of accommodations, they typically involve changes to the physical exam space (e.g., increased lighting), materials (e.g., enlarged font size), process (e.g., increased exam time) or involve the

addition of intermediaries (e.g., scribes or interpreters). In many cases, more than one accommodation may be used in the same exam administration. For example, an exam candidate who is blind may require sitting an examination with a reader, in a private room, with extended time. Typically, the cost of these accommodations is borne by the educational institution or test administrator and not by the candidate.

One contentious issue regarding accommodations and testing that came up in my preliminary reading involved a practice known as *flagging*. Flagging occurs when testing agencies indicate in their report of exam scores which scores were obtained under non-standardized conditions (i.e., accommodated exams). For example, scores obtained on accommodated administrations of the Medical College Admission Test (MCAT) are marked with an asterisk to indicate that the test was administered in nonstandard conditions, although not every type of accommodation results in flagging (Julian et al., 2004). Those opposed to flagging fear that the practice unfairly identifies individuals with disabilities, as transcripts or exam scores are often reviewed as part of future admission processes to professional associations or subsequent training programs (Sireci, 2005). Thompson and Thurlow (2002) suggest that more accessible exam designs could reduce flagging by reducing the need for accommodations in the first place. Accessibility in exam design is sometimes referred to as universal test design (UTD) and increases accessibility to the widest range of test-takers possible.

Assessment

Assessments (often used synonymously with *tests*) are systematic methods to obtain information about particular characteristics of a person or group (AERA, APA, & NCME, 2014) and are used to draw inferences or make judgements about those individuals' abilities, knowledge, and skills (Downing & Yudkowsky, 2009). The assessments of interest to me, health professions licensing exams, are criterion-referenced, summative assessments. Criterion-based exams require candidates to demonstrate competence in a defined set of skills at a predetermined level of proficiency, most often in accordance with the profession's competency profile (in contrast to norm-referenced exams which compare exam candidates to other candidates). Summative assessments refer to those used at the end of a period of instruction, as opposed to formative assessments which measure progress incrementally for the purpose of informing decisions regarding the pace or direction of curricula (Downing & Yudkowsky, 2009). As previously mentioned, most health professions licensing exams are offered by third-party or

specially-appointed assessment organizations (i.e., not the training institute nor the regulator) and involve at least two components: a written exam (very often using multiple choice questions, known as MCQ) and a performance-based assessment (often an objectively structured clinical evaluation, known as OSCE, or other standardized oral examination formats). The MCQ format is common in high-stakes ETP exams for its standardization and ease of scoring. These exams are often computer-administered[4] and electronically scored. Performance-based exams like OSCEs involve interactions with patients (or actors portraying patients) and are usually divided into stations, each requiring the exam candidate to demonstrate a different set of clinical skills while examiners observe and score the performance. Ideally, large-scale licensing exams are developed according to recognized industry standards for testing and measurement. While the steps in this process will vary according to the resources and demands of the assessment program, the process generally involves some common steps: creation of a content outline or blueprint to communicate what subject matter the exam will cover, creation of actual test items, standard setting or establishing the minimum passing score, and ongoing surveillance of the test's performance based on analyses of candidate responses and feedback (AERA, APA, & NCME, 2014).

Psychometrics

Psychometrics is a field of study concerned with the assessment or measurement of individual differences, most often the quantitative aspects of those differences and the degree of accuracy to which they've been measured (Shultz & Whitney, 2005). Psychometrics is built upon three pillars—validity, reliability, and fairness—each of which is distinct yet inextricably intertwined. Validity**,** according to *The Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014), is the most fundamental concept to testing and measurement. Validity refers to the degree to which evidence and theory support the interpretations and use of test scores. More simply, validity exists when an exam measures what it is intended to measure.

[4] Some computer-administered exams adapt to individual candidates based on their pattern of item responses. This type of computer-adaptive testing means that different candidates are not necessarily exposed to the same test items nor the same number of items (thus limiting item exposure), as an algorithm determines when each test-taker has proven his or her competence. Candidates who hover near the cut-off score for passing may be required to answer a greater number of questions to determine on which side of the cut they belong, as opposed to candidates who consistently answer questions correctly.

Reliability, on the other hand, refers to the consistency of scores across replications of a testing procedure (AERA, APA, NCME, 2014). If an exam candidate is exposed to an alternate exam form and results differ (beyond the standard error of measurement), the reliability is said to be low. Reliability, and its close relative standardization, is crucial in large-scale, certification assessments. Every exam candidate must be exposed to the same examination experience (with the exception of different exam forms which are alike in as many ways possible and statistically equated) making all administrations as similar as possible. Changes in the standardization of an exam exposes administrators to appeals by candidates who believe that those changes negatively impacted their performance. This ties directly to fairness, our third pillar, which unlike validity and reliability, has no technical definition. Fairness, according to *The Standards*, is critical to protect exam candidates and users of exam scores. The relationship between fairness and accommodation use for candidates with disabilities is obvious: accommodations enable access to exam environments and processes, permitting unobstructed opportunities for candidates with disabilities to demonstrate their knowledge of the constructs being measured without the barriers and hardships imposed by the standard (i.e., non-accommodated) exam.

Summary

As we have seen from this introductory chapter, accommodation use in the certification of health professionals is a multifaceted issue. While I contemplated various study designs to address one or more of these facets, I decided that what was most needed in the scholarly literature was a systematic exploration of the problem as a whole. A scoping review afforded me with the perspective I needed to systematically define the issues or gaps in our body of knowledge and lay a firm foundation for future studies. I present the manuscript for that scoping review in the following chapter, which I have prepared according to the submission guidelines for the peer-reviewed journal *Evaluation & the Health Professions (SAGE journals)*. The number of words and tables included in the manuscript exceeds the target journal's limits, but I have opted to present the extended version here, including its full complement of tables and figures, for the benefit of my MA thesis examiners. The article contains a description of the research problem, the full methodological approach, as well as the results, and final discussion. Following the article, I conclude my MA thesis in chapter three by reflecting upon the major lessons learned while conducting this study. I also expand upon the wider implications of my work for the fields of health professions education and assessment.

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II. Accommodations in the Assessment of Health Professionals at Entry-to-Practice: A Scoping Review

Introduction

Mandatory entry-to-practice (ETP) examinations, also referred to as certification or licensing exams, are essential to determine whether health professionals possess the necessary competence to practice safely and effectively within their chosen fields. Entry-to-practice exams are high-stakes, standardized exams developed with a particular exam candidate in mind: typically one who can independently navigate the exam environment and perform tasks under strict time constraints. Experience, however, reveals that not every candidate fits this description. Increasingly, candidates with disabilities (e.g., hearing loss, dyslexia, attention deficit hyperactivity disorder) seek careers in the health professions and consequently apply to sit the ETP examinations required of their chosen professions (Bevan, 2014; Hafferty & Gibson, 2001; Hinman, Peterson, & Gibbs, 2015; Locke, Alexander, Mann, Kibble, & Scallan, 2017). Obligated by antidiscrimination laws, if not an innate sense of justice, exam administrators respond to these situations by offering accommodated examinations, the aim of which is to create an equitable testing environment that enables the candidate with disabilities to demonstrate his or her competence despite exceptionalities. While accommodations are intended to increase candidates' participation in or access to the examination without inflating test scores, alterations to standardized testing environments have potentially negative impacts on the fairness of the examination and on the validity of the interpretations of scores obtained on those exams (AERA, APA, & NCME, 2014; Julian, Ingersoll, Etienne, & Hilger, 2004; Kettler, 2012; Phillips, 1994; Stretch & Osborne, 2005). In turn, this threat to validity can lead to the use of potentially inaccurate data to inform judgments of a candidate's readiness for professional practice. In the context of health professions, these misjudgments may also have deleterious consequences on patient safety.

Accommodations can take many forms, including changes to the physical exam space (e.g., increased lighting), reformatting of exam materials (e.g., enlarged print), alterations in administration (e.g., extended testing time), or additions to the environment such as assistive devices (e.g., magnifiers) or intermediaries (e.g., scribes or language interpreters). Ideally, accommodations address only those aspects of the exam that would interfere with the assessment of a candidate's knowledge and skills, and would not alter the exam's construct(s) (that which

the exam is designed to measure). However, this poses a particular challenge for exam administrators, as the medical or other professionals tasked with recommending accommodations lack intimate knowledge of the exam's construct(s) and setting(s).

There are other factors compounding this problem. First, the numbers of post-secondary students with disabilities is increasing (Bevan, 2014; Hafferty & Gibson, 2001; Harrison & Holmes, 2012; McCloy & DeClou, 2013; Stretch & Osborne, 2005). To meet the growing needs of this population, test administrators require evidence to guide consistent decision-making regarding accommodation use. However, some researchers (Hinman et al., 2015) suggest that evidence-informed practices for assigning accommodations are lacking and that the implications of accommodations remain largely unknown. Second, there are significant ramifications for the misuse of accommodations. Besides an increased risk to public safety as previously mentioned, accommodation misuse can also result in a loss of candidate resources (e.g., time, registration fees) and in some cases, a violation of their human rights. Allegations of discrimination involving accommodations in health professions education and licensure are well documented in the case law literature and have brought the issue of accommodations to the forefront of many social institutions. Third, accommodation misuse can result in a loss of valuable contributors to the health workforce when otherwise competent candidates are inadequately accommodated and denied entry to their professions (Hargreaves, Dearnley, Walker, & Walker, 2014). Advocates of greater diversity within the health professions uphold the view that a more diverse health workforce, including those with disabilities, not only better reflects the society it serves, but improves the quality and delivery of patient care (Dearnley, Elliot, Hargreaves, Morris, Walker, Walker, & Arnold, 2010).

Purpose and Research Questions

To address the above-mentioned issues, this scoping review sought to systematically identify and characterize the scholarly literature regarding accommodation use within health professions certification or licensing programs. In doing so, the study aimed to increase access to information used to inform accommodation decision-making and improve the experiences of those with disabilities seeking entry to the health professions. The study also sought to delineate the gaps in that body of literature and through stakeholder consultation to prioritize the avenues for future research initiatives. As such, the study revolved around two research questions: (1) What is the current state of academic literature on accommodation use in the assessment of

health professionals at entry-to-practice? and (2) What future programs of research would address stakeholders' concerns about the use of accommodations in the assessment of those professionals?

Methods

To address the research questions, I conducted a scoping review that included a stakeholder consultation exercise (Levac, Colquhoun, & O'Brien, 2010). Scoping reviews examine the extent, range, and nature of research activity in a particular field when evidence in that field is only beginning to emerge and systematic reviews of the topic do not yet exist. Additionally, scoping reviews summarize and disseminate research findings, identify research gaps, evaluate the need for future research (Arksey & O'Malley, 2005), and identify sources of evidence to inform practice or policymaking (Daudt, vanMossel, & Scott, 2013). As described in the sections that follow, Stages I to V constituted Phase One of the present study and Stage VI constituted Phase Two.

Phase One

To describe the research activity involving accommodation use in the certification of health professionals with disabilities, I conducted a literature synthesis following the five stages of a scoping review defined by Arksey and O'Malley (2005).

Stage I: Identifying the research questions. The above-mentioned research questions underpinned all stages of the review. The terms and concepts comprising my two questions were deliberately broad to generate a breadth of coverage when scoping the literature (Arksey & O'Malley, 2005). For example, the term "accommodation" captured a range of alterations or additions to an examination and the term "assessment" covered all forms of testing (written and performance-based) used in ETP licensing exams. The definitions of "health professionals" and "stakeholders" are defined in Stage VI (Phase Two) below.

Stage II: Identifying relevant studies (designing a search strategy). Informed by the research questions, I carefully selected search terms that would narrow in on the desired literature without unintentionally excluding relevant studies. The search terms belonged to one of three domains—assessment, accommodation, or profession—and were comprised of medical subject headings (MeSH) selected for each database as well as truncated key words (see Table 1). Each search strategy involved Boolean strings from within and across the three domains, which I applied to five large health or education databases: Embase (OvidSP), Education

Resources Information Center - ERIC (OvidSP), Cumulative Index of Nursing and Allied Health Literature - CINAHL (EBSCOHost), MEDLINE (OvidSP), and PsycINFO (OvidSP). To enhance the quality of my searches, I consulted a health sciences research librarian with expertise in scoping methodology who performed a peer review of the electronic search strategies (PRESS) developed for each database. Feedback from that process allowed me to refine my approach. I executed the final searches in December 2017 and I housed the resultant data in *Endnote (version 8)*. Additionally, once I had identified the key articles for my review, I hand-searched those articles' reference lists to select additional studies for screening that had not been identified by the electronic database searches.

[Insert Table 1 here]

Stage III: Study selection. Following the initial search, I transferred the data from *Endnote* into an online screening software, *Covidence*. I established inclusion and exclusion criteria (see Table 2) to ensure consistent and reproducible decision-making throughout the screening process and to also ensure that only those articles that addressed my research questions were marked for inclusion. With assistance from a secondary screener experienced in health professions certification who I trained in the inclusion/exclusion criteria, we independently reviewed all sources at the level of title and abstract. We settled any disagreements at this stage with a third screener (who has expertise in health professions education and who I also trained in the inclusion/exclusion criteria). The inclusion/exclusion criteria revolved around the population studied, the assessment context, and the presence of a disability-related accommodation. We excluded articles if they were not available in English or had a publication date prior to 1990. We did not consider the methodology (i.e., study design) or methodological rigour of the articles under review (Arksey & O'Malley, 2005; Levac et al., 2010). Following the title and abstract screening, I reviewed the remaining articles in their entirety (i.e., full text review). A secondary screener then appraised the articles that remained following my full text review to confirm their suitability to the study.

[Insert Table 2 here]

Stage IV: Charting the data. Having identified all of the relevant literature, I began a charting or data extraction process to assist in mapping the literature and thus addressed the first underpinning research question. Charting was an iterative process that evolved along with my familiarity of the texts. The data-charting form required extracting common characteristics of

each study, including the authors' names, publication dates, locations, population features (e.g., profession, disability, accommodation), study aims, and themes. I created and populated the charting form using *Microsoft Excel (version 15.15)*.

Stage V: Analyzing and reporting the results. Analysis of the scoping review involved two components: the presentation of a descriptive summary of the numerical findings from Stage IV and the presentation of the articles' emergent themes. The numerical summary reported the number and types of studies included, the study dates, and the features of the study populations. The thematic construction was a more complex process that involved identifying the salient and recurring areas of conversation within and across the selected articles pertaining to accommodations in a licensing context. I then grouped these conversations into like categories that I later collapsed into major and minor themes. I conducted this thematic analysis by hand and in consultation with my secondary screener.

Phase Two

Stage VI: Stakeholder consultation exercise. As recommended by Levac et al. (2010), I included a compulsory consultation exercise to accompany the scoping review. I conducted the exercise by surveying key stakeholders to enhance and validate the findings of my review. Furthermore, the consultation enabled me to identify stakeholders' concerns, delineate gaps in the literature and intimate recommendations for future programs of research based not solely on my interpretation of the literature, but on the direct feedback of my participants.

Participants. My stakeholder population was made up of 68 stakeholders from three groups: the 28 certification exam administrators responsible for the Canadian province of Ontario's 26 regulated health professions[5], Ontario's 26 health regulatory bodies, and the 14 authors/researchers who had published on the topic of accommodations in health licensing contexts (identified as the corresponding authors from the articles included in my above-mentioned review). These three groups, outlined in Table 3, represent those with extensive familiarity with either the development, administration, or use of accommodated ETP exams for health professionals and share an interest in the outcomes of those exams.

[5] These health professions are defined by Schedule 1 of the *Regulated Health Professions Act* (1991). While the literature sought in the scoping review was not limited to Ontario (or even Canada), the adoption of this definition was necessary to limit the number of professions included in the review's lengthy list of search terms (described in Stage II) and to provide context for the identification of a manageable stakeholder population.

[Insert Table 3 here]

Instrument development and data collection. The eight-item stakeholder survey (see Appendix A) consisted of structured (i.e., forced selection) and unstructured (i.e., open-ended) response formats, including three demographic questions to identify the respondent's primary stakeholder affiliation (i.e., administrator, regulator, or researcher). I designed the survey items to determine the relevance of the literature to stakeholders as well as to identify stakeholders' most significant accommodation challenges in addition to their preferred areas for future research. Prior to administering the survey, I obtained Research Ethics Board approval from the University of Ottawa (see Appendix B) and I piloted the survey with 10 professionals knowledgeable in the areas of questionnaire design, health professions regulation, or accommodations in post-secondary education, but who were not members of the stakeholder groups and were thus, ineligible to participate in the study. Feedback obtained by piloting the survey allowed me to estimate the completion time (5-8 minutes), fine-tune the wording (enhancing its comprehensibility), and confirm that no essential questions were missing. I also developed a table of specifications (see Appendix C) to ensure alignment between each survey item and my underlying research questions.

I recruited participants via email invitations (see Appendix D) to complete the electronic, web-based survey hosted through *Qualtrics*. A study information letter (see Appendix E) outlining the study procedures and participant obligations accompanied the invitation email. Consent to participate in the study was implied by the participants' electronic submission of their completed questionnaires. Data collection occurred over a 30-day period beginning in mid-June, 2018. To maximize participation in the study, I sent reminder emails through Qualtrics's automated distribution system at predetermined intervals (days 14 and 28) to non-responders stressing the importance of their participation and highlighting the study's end date (Dillman, 2007).

Data analysis. I analyzed the survey responses using *IBM SPSS (version 24)*. I calculated basic descriptive statistics (e.g., frequencies and percentages) to characterize and sort the data. I coded the open-ended text responses using quantitative content analysis (Neuendorf, 2002) whereby similar responses were categorized together to tabulate frequency counts and determine the number of participants referencing each category. Given the minimal amount of open text

data provided by respondents, I completed this coding by hand and a secondary coder verified its accuracy.

Phase One Results

Numerical Summary

Screening. The database searches resulted in 2,195 articles for screening. Of these, *Covidence* automatically identified and removed 356 articles as duplicates. In conjunction with a secondary screener, we then screened the remaining 1,839 studies at the level of title and abstract. Due to their lack of relevance to the topic, we removed 1,757 studies at this stage. I then assessed the remaining 82 articles at the level of full-text screening. Of these, I identified 12 articles for final inclusion. The primary reason for excluding articles at the level of full-text screening was that one or more of the inclusion criteria was not met (e.g., articles focused on classroom-based assessments rather than licensing exams). My hand searching of reference lists from key studies resulted in the identification of three additional articles for inclusion, bringing the total number of articles for analysis to 15. Figure 1 presents the article screening and selection process in the form of a PRISMA[6] flow diagram.

[Insert Figure 1 here]

Location, date, publication type & purpose. All 15 articles originated in the United States of America. The articles spanned a range of publication dates, and all, with the exception of one (Little, 1999), were published during or after the year 2000. The journal types represented a range of health disciplines, but they also crossed over into other fields including psychology, education, ethics, law, and disability studies. The article type fell into two broad groups: empirical studies—consisting of two survey-based studies (Johnson, 2006; Joy, Julius, Akter, & Baron, 2010) and one psychometric-based analysis (Woo, Hagge, & Dickison, 2013)—and commentaries or position papers, which comprised the remaining 12 articles. Almost half of the articles (n=7) focused on accommodations in health licensing contexts, whereas the remainder (n=8) focused on accommodations in health professions education, but made considerable reference to licensing contexts thereby meeting the inclusion criteria. The empirical studies (n=3) sought to describe the metrics of accommodations in dental licensing exams (Johnson, 2006), the documentation supplied by osteopathy candidates requesting accommodations on grounds of

[6] Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher, Liberati, Tetzlaff, & The PRISMA Group, 2009)

attention deficit hyperactivity disorder (Joy et al., 2010), and the effects of extended time accommodation on differential item functioning in the national nursing exam (Woo et al., 2013). The commentary or position papers (n=12) addressed a wide-range of topics relevant to disability and accommodation use in health education and licensing. For example, they included test equity for deaf exam candidates (Saladin, Reid, & Shiels, 2011) and a criticism of technical standards in relation to candidates with physical and sensory disabilities (McKee et al., 2016). The purpose of most commentaries, however, was to highlight the concerns and/or strategies of educators faced with increasing numbers of students requesting accommodations on the basis of disabilities (Table 4 presents the complete data extraction form). Given my underlying research questions, my interest was in those sections of the articles that pertained to accommodations in licensure, not in accommodations for learning or for classroom-based assessments.

[Insert Table 4 here]

Type of profession, disability, & accommodation. The vast majority of articles (n=14) focused on a particular health profession. They included medicine (Little, 1999; Hafferty & Gibson, 2003; Ballard & Elwork, 2003; Little, 2003; Blair & Salzberg, 2007; Joy et al., 2010; McKee et al., 2016), nursing (Ijiri & Kudzma, 2000; Helms, Jorgensen, & Anderson, 2006; Woo et al., 2013), physical therapy (Ingram, Mohr, & Mabey, 2015), occupational therapy (Gupta, Gelpi, & Sain, 2005), rehabilitation counselling (Saladin et al., 2011), and dentistry (Johnson, 2006). The remaining article (n=1) did not focus on any particular profession. Instead, it focused on allied health professions as a group (Newsham, 2008). Regarding types of disabilities, six of the articles focused on learning disabilities (Little1999; Ijiri & Kudzma, 2000; Ballard & Elwork, 2003; Hafferty & Gibson, 2003; Little, 2003; Ingram et al., 2015), two articles focused on physical and sensory disabilities (Saladin et al., 2011; McKee et al., 2016), and one focused on attention deficit hyperactivity disorder (Joy et al., 2010). The remaining articles (n=6) referred to disabilities generally without focusing on any particular type. With the exception of Woo et al. (2013), the articles did not concentrate on a particular type of accommodation. In Woo et al. (2013), the authors discussed and empirically examined the fairness of extended time accommodations.

Thematic Summary

Four major themes and three minor themes emerged from the data extraction process. The major themes include: (a) interpreting disability legislation, (b) accommodation

administration and processes, (c) relationships between education and licensure, and (d) psychometrics and test development. The minor themes include: (a) social justice, (b) patient safety, and (c) growing accommodation needs. Unlike the major themes which represent explicit topics within the selected literature, these minor themes represent more nuanced concepts that appeared as motivations or undercurrents behind the major themes, but were not the focus of the article. An overview of the thematic structure, including the areas of conversation constituting each theme, is presented in Figure 2.

[Insert Figure 2 here]

Interpreting disability legislation. The most dominant theme across the selected literature revolved around the interpretation of key concepts within the *Americans with Disabilities Act* (ADA). The ADA is a fundamental statute aimed at eliminating disability-related discrimination and increasing social accessibility and inclusion for those with disabilities. Under this Act, social institutions, including universities and licensing boards, are mandated to consider accommodation requests on grounds of disability. This theme was present to some degree across the whole body of literature, but constituted a major topic of discussion in nine of the 15 articles (Little, 1999; Ijiri & Kudzma, 2000; Little, 2003; Hafferty & Gibson, 2003; Ballard & Elwork 2003; Gupta et al., 2005; Helms et al., 2006; Blair & Salzberg, 2007; Newsham, 2008).

At its core, interpreting legislation revolved around the challenge of defining *disability*, a contentious but necessary task to determine who is eligible for protection (i.e., accommodation) under the ADA. Within the literature, authors frequently explored this challenge through the presentation of case law, wherein exam candidates accused licensing boards of unlawful discrimination for denying their requests for accommodations. Little (2003) as well as Hafferty and Gibson (2003) discussed at length a case involving an aspiring physician who was denied extended time accommodation by the National Board of Medical Examiners (NBME). What stood out in this case was that the candidate had a well-documented learning disability and a record of previous accommodation use at medical school (factors that regularly work in a candidate's favour when requesting accommodations). Nonetheless, the courts upheld the NBME's decision to deny accommodation, citing that the student failed to demonstrate that her disability 'substantially limited a major life activity,' in this case reading, and therefore disqualified her for protection under the ADA. This case was one among many discussed in the literature that demonstrated the courts' tendencies to deny accommodations for high-stakes

licensure exams, and highlighted that even those candidates with disabilities diagnosed by medical experts will not necessarily qualify as disabled under the antidiscrimination law (Little, 2001; Helms et al., 2006; Blair & Salzberg, 2007; Newsham, 2008).

Subsequently, the theme continued through conversations involving what constitutes a *substantial limitation* on a major life activity. Helms et al. (2006) pointed out that whether an impairment is substantially limiting is ordinarily determined in reference to the abilities of the general population. However, the authors go on to pose that it may be more fitting in the case of health professions candidates to compare their abilities with other health professionals, and not to the general population. They raised the question of who the comparator group should be for individuals like aspiring physicians who have already demonstrated an ability to achieve academic success at levels above the average (Helms et al., 2006).

Another contested issue related to this theme was the concept of *otherwise qualified* for professional practice. Ballard and Elwork (2003) simplified the concept using the example of an accountant who uses a wheelchair: the ability to perform mathematical computations, they argued, is in no way affected by the disability (paralysis) or the required accommodation (an accessible workspace). Hence, the accountant is deemed otherwise qualified to perform in his role. The authors noted that difficulty arises when there is potential overlap between the disability and the essential requirements of the job (Ballard & Elwork, 2003). Cases involving learning disabilities in health professions, for example, present a complex challenge when determining whether the disability impacts the cognitive requirements to function safely in practice. Ballard and Elwork (2003) urged readers to consider that the presence of a disability may be the very thing that disqualifies one as a suitable candidate for a demanding job in the health professions. They concluded by reminding readers that the ADA is intended to guarantee equal opportunities, but not necessarily to guarantee equal outcomes.

Another prominent conversation regarding the legislation involved defining *reasonable accommodation*. Blair and Salzberg (2007) called for researchers to move past the question of who is eligible for accommodation and to begin exploring what the ADA means by reasonable accommodation. These authors underlined that while there is case law available to inform matters of eligibility, the law is virtually silent on describing reasonable accommodations, particularly what is reasonable within licensing contexts. There were, however, examples within the literature describing *un*reasonable accommodations, namely those that fundamentally alter a

training program (Ijiri & Kudzma, 2000), cause economic hardship for the institution offering it (2000), or pose increased risks to the health and safety of others (Newsham, 2008). Some authors (Gupta et al., 2005; Helms et al., 2006; Ijiri & Kudzma, 2000; Newsham, 2008) provided more specific examples of unreasonable accommodations. These included accommodations for language fluency issues and test anxiety (Ijiri & Kudzma, 2000), or accommodations for conditions that could be mitigated by medications or other interventions (Newsham, 2008; Helms et al., 2006). Furthermore, Gupta et al. (2005) pointed out that accommodations for temporary conditions, such as fractures or medical emergencies, are not specifically protected under the ADA, although some agencies (e.g., National Board for Certification in Occupational Therapy) will consider accommodation requests on these grounds (Gupta et al., 2005). Several authors (Blair & Salzberg, 2007; Ijiri & Kudzma, 2000) emphasized that when it comes to defining reasonable accommodations, courts make their decisions on a host of factors and that each accommodation granted (or denied) is determined on a case-by-case basis.

Accommodation administration and processes. The conversations in the selected literature also explored more practical matters of how licensing boards and test agencies go about assigning and implementing accommodations. Of particular interest to some authors was the application process itself, specifically what information licensing boards requested of applicants seeking accommodations. For example, Little (1999) noted that the NBME looks for a previous history of accommodation use (among other things) and in the case of learning disabilities, a history that began as early as elementary school. Little (1999) argued that many students with learning disabilities reach post-secondary school and gain entry to competitive programs like medicine with no prior history of accommodation use. The author contended that access to future accommodations in licensing exams should not be withheld from these students simply because of their previous unaccommodated academic achievements. In addition, some authors (Blair & Salzberg, 2007; Ingram et al., 2015) raised concern over the quality of such evidence as historical records of accommodation use. They pointed out that accommodations granted in grade schools are often times assigned by teachers who lack the necessary training to do so, and that these accommodations are frequently given to students whose conditions have not been adequately assessed or diagnosed. As such, Ingram et al. (2015) pointed out that informal accommodations offered by well-meaning teachers (e.g., granting a student extended test time in absence of a formal request or documentation) may not benefit students in the long run and that

early detection of disabilities combined with well-documented histories of accommodation use may be crucial to students' securing accommodations later in life.

There were other concerns raised over the evidence requested by licensing agencies to verify the presence of a disability. Joy et al. (2010) examined the documentation provided to the National Board of Osteopathic Medical Examiners by candidates requesting accommodations on the grounds of having attention deficit hyperactivity disorder (ADHD). The study found that only seven of the 50 applications received by the Board contained the required evidence to confirm the diagnosis of ADHD. The authors pointed out that this is problematic, as licensing boards do not themselves medically assess candidates to confirm diagnoses, but rather rely on the assessment results supplied by other professionals. Licensing agencies, the authors maintained, must therefore ensure that the evidence submitted is not only complete but prepared by qualified professionals. The authors cited findings from a study that highlighted how the vast majority of physicians who were asked to prepare documentation supporting accommodation requests for one large-scale examination program felt inadequately-trained to do so, and that almost half of the clinicians tasked with diagnosing ADHD did not follow internationally-accepted criteria to establish the diagnosis (Gordon, Lewandowski, Murphy, & Dempsey, 2002 as cited in Joy et al., 2010). As discussed by Blair and Salzberg (2007), this problem is confounded by evidence that physicians and other professionals not only lack training to inform appropriate accommodation use, but are often times completely unaware of the exam constructs and environments in which the accommodations they recommend will be used. Further to this, physicians have no training in test validity in psychological measurement to consider how the accommodations may impact the use of findings obtained on accommodated exams (Blair & Salzberg, 2007).

Once requests for accommodations are reviewed, decisions must be made as to whether candidates will receive accommodations and, if so, what those accommodations will be. The literature revealed variation within and between health professions as to which entity makes these final decisions: the testing agency who oversees the design and administration of the exam, or the licensing board (i.e., regulator) who uses the test's scores to determine if a candidate is ready for entry into professional practice. For example, Ingram et al. (2015) pointed out that in the profession of physical therapy, independent state boards assign accommodations, whereas in the professions of dentistry, medicine, and occupational therapy, the national testing agencies manage accommodation requests. The authors highlighted the potential for inconsistent decision-

making, even within the same profession, when different jurisdictions are responsible for assigning accommodations to candidates who will then sit a national examination (2015). For the profession of physical therapy, the authors (Ingram et al., 2015) noted that this inconsistency could be somewhat mitigated if individual state boards agreed to follow the accommodation guidelines established by the national testing agency for physical therapy, however state boards were not mandated to follow this guide. In the profession of nursing, Ijiri and Kudzma (2000) described that state nursing boards first receive and evaluate accommodation requests and pass their recommendations on to the national testing agency who then reviews the recommended accommodations in light of their likely impact on the exam's psychometric properties.

The literature provided only minimal insight into how testing agencies accommodated in relation to various disabilities. The majority of available information pertained to accommodating candidates with learning disabilities. Several authors (Ballard & Elwork, 2003; Gupta et al., 2005; Ingram et al., 2015) commented that learning disabilities are the most common reason for accommodation requests at licensing exams and that the accommodation most frequently approved for these disabilities is extended test time to mitigate slow reading or mental-processing speeds. In the national licensing exam for physical therapy, Ingram et al. (2015) noted that between the years 2000-2009, the majority of candidates tested with accommodations received more than one accommodation and that extended test time, usually granted on the basis of a learning disability, accounted for 96% of the accommodations granted. The authors added that 52% of the candidates receiving accommodations took their examination in a private room (Ingram et al., 2015).

Two authors (Little, 1999; Ijiri & Kudzma, 2000) commented on the difficulty students with learning disabilities have when confronted with timed, multiple choice questionnaire exams, a common format for licensing examinations in the health professions. Beyond the type of question design, the medium in which the exam is delivered may also impact exam performance. Ijiri and Kudzma (2000) commented that computer-based exams can be helpful to some students with learning disabilities since this format typically displays a single question per screen, thereby facilitating mental-processing (as opposed to paper exams where multiple questions may appear on a single page). However, the authors (Ijiri & Kudzma, 2000) also noted that computer-based exams that employ computer adaptive testing (CAT) pose a challenge for candidates with

learning disabilities due to these students' characteristic response patterns that trigger the CAT algorithm to issue a greater number of test items (2000).

Blair and Salzberg (2007) made a unique contribution to the accommodation literature by suggesting whether candidates who request accommodations should first sit the examination under standard conditions to allow administrators to assess exactly the type of accommodation that is required given the candidate's performance. The authors also suggested a method of evaluating accommodations, the Dynamic Assessment of Test Accommodations (DATA) method, that they proposed may be beneficial to licensing exam administrators. This method, they contended, was superior to traditional methods for assigning accommodations when tested in public schools, and resulted in a decrease of accommodation use.

Saladin et al. (2011) offered recommendations for improving the administration of accommodated exams for exam candidates with disabilities. The authors suggested that exam administrators keep their accommodation policies and procedures up-to-date and in readily-available, accessible formats. Furthermore, they suggested that testing agencies publish sample test items containing the same style of language and item construction as actual tests. This way, the authors pointed out, candidates can better evaluate their accommodation needs given the accessibility level of the exam's language. This is particularly useful for exam candidates who may not have access to English because they are deaf or profoundly hard-of-hearing (Saladin et al., 2011).

Relationships between education and licensure. Many authors (Hafferty & Gibson, 2003; Helms et al., 2006; Ingram et al., 2015; Little, 2003; Newsham, 2008) drew attention to the potential for disconnect between the agencies responsible for health professions education and licensure, as well as to the problems that this disconnect can cause for health professions candidates with disabilities. Some authors (Ballard & Elwork, 2003; Gupta et al., 2005) suggested that this disconnect stemmed from differing mandates between entities: schools are motivated to help students achieve academic success (i.e., degree attainment), whereas licensing boards exist for the purpose of public protection. In reference to medicine, Hafferty and Gibson (2003) referred to the "essentially autonomous fiefdoms" (p. 197) of education (including schools, clinical departments, residencies, state boards, etc.), each yielding control over various stages of a student's training, and who, according to the authors, pass along students even when doubting their professional competence. The result, according to Ballard and Elwork (2003), is

an overreliance on the licensing boards to finally weed-out incompetent or unsuitable candidates that training institutions should never have admitted into their programs.

At the crux of this issue are the health professions students with disabilities who have been granted accommodations by their education institutions during training but are denied the same accommodations by licensing boards or ETP test administrators at entry-to-practice (Hafferty & Gibson, 2003; Helms et al., 2006; Ingram et al., 2015; Little 2003; Newsham, 2008). Hafferty and Gibson (2003) painted a strained relationship between American medical schools and the national licensing board for medicine, stemming from the board's history of denying accommodations to students who received accommodations at school. In response to this history, Little (2003) raised the question of whether licensing examinations are valid measures of candidate's readiness for practice. Helms et al. (2006) added that schools have virtually no control over the accommodation decisions made by licensing boards.

To help reduce this gap between training and licensing, several authors (Gupta et al., 2005; Helms et al., 2006; Ingram et al., 2015) recommended that schools model their accommodation policies after those of licensing boards (to the extent possible) so that students are accustomed to testing under the same conditions they will likely encounter during licensing. These authors emphasized that educators should also consider the end goal of professional practice when making accommodation decisions for students so that only those accommodations suitable in practice would be introduced during training. This emphasis on the outcome of professional practice within the education of rehabilitative professionals was in marked contrast to the medical profession, which according to Hafferty and Gibson (2003) focused heavily on academic achievement rather than job preparedness.

The literature suggested that in order for schools to align themselves with the practices of licensing boards, they require access to those boards' policies and metrics relating to accommodation use. Ingram et al. (2015) wrote that the historical pass rates of accommodated versus non-accommodated exams should be made available to educators so that students can be fully informed before pursuing accommodations at licensing exams. One study, however, suggested that obtaining metrics from health professions testing agencies may be difficult. Johnson (2006) set out to determine the types and frequencies of accommodations requested and granted at the American dental licensing examinations. Johnson's (2006) work revealed that data management across agencies delivering this exam was inconsistent and in some cases completely

lacking. He reported that 3 of the 14 licensing agencies surveyed had kept no records at all pertaining to accommodation use and only 5 of the 14 agencies had kept records for the five years in question (Johnson, 2006). Johnson (2006) referred to the lack of detailed records as "troubling" (p. 478). Another finding reported by Johnson (2006) was that the number of accommodations granted decreased as the training trajectory moved from the admissions test for dental school through to the two components of the professional licensing exam.

Another element of the relationship theme is the role of technical standards and essential job functions. Technical standards are developed by individual training programs and outline the cognitive, psychomotor, and social skills required of candidates seeking admission to those programs (Newsham, 2008). Essential job functions refer to the nonnegotiable job tasks necessary for employment in specific health care settings (Gupta et al., 2015). Alignment between these two separate but related sets of requirements is crucial to consistent decision-making when granting accommodations. Several authors (Hafferty & Gibson, 2003; Ballard & Elwork, 2003; Gupta et al., 2005; Newsham, 2008) suggested that decision-makers must look at whether or not technical standards are maintained when accommodations are used. However, Gupta et al. (2005) reported that not all professions have clearly-defined or agreed-upon technical standards. In addition, the authors (Gupta et al., 2005) commented that essential job functions for the same profession may differ from one place of employment to another. In relation to the medical profession, Hafferty and Gibson (2003) called for licensing boards and education programs to come to a common agreement about the technical standards required for professional practice, as well as to reach consensus about the purpose of medical training (degree attainment versus medical practice). The authors (Hafferty & Gibson, 2003) asserted that before these issues are sorted, it is impossible to assess the appropriateness of particular accommodations.

The relationship between educators, licensing boards, and test administrators necessarily involves an exchange of particular information regarding exam candidates' abilities and disabilities. Helms et al. (2006) and Newsham (2008) raised concerns about the type of information that educators share with licensing boards regarding students with disabilities, pointing out that these students are entitled to a degree of privacy. The authors (Helms et al., 2006; Newsham, 2008) suggested that all involved parties inform themselves of what can legally be shared regarding students' disabilities and diagnoses, keeping in mind that breaches of

students' confidentiality are unlawful. Newsham (2008) suggested that educators seek written consent from students to discuss matters involving disability with boards or test administrators. She specified that licensing boards should refrain from asking about students' mental or physical health, including current or past treatment for mental illness or substance abuse, but that boards may ask about students' behaviours and capabilities to perform professional duties for the purpose of appraising students' fitness to practice. Helms et al. (2006) commented on a controversial practice in testing known as *flagging* which may threaten students' privacy. Flagging occurs when a testing agency indicates to licensing boards (or other entities) that test scores were obtained under nonconforming conditions (i.e., with accommodations) and that the exam administrators no longer attest to the validity of interpretations made from these scores (Helms et al., 2006). The authors pointed out that this practice needlessly identifies those with disabilities and exposes the students to potential future discrimination.

Psychometrics and test development. In addition to discussing the legal obligations of test administrators, some authors discussed administrators' duties to meet the norms and standards set forth by the field of testing and measurement. For example, Ijiri and Kudzma (2000) stressed the importance of maintaining an exams' psychometric properties, namely validity and reliability, when introducing accommodations into the exam process or environment. In addition, the authors (Ijiri & Kudzma, 2000) reminded readers that upholding exam security is another crucial component to meeting high testing standards and that accommodations must not compromise the security of exam content (2000). Ballard & Elwork (2003) drew on definitions from *The Standards for Educational and Psychological Testing* to highlight that accommodations should only address irrelevant disabilities in licensing exams and as such, accommodations that may mask job-related disabilities (i.e., those that interfere with competent practice) not be granted.

Several authors (Ballard & Elwork, 2003; Blair & Salzberg, 2007; Woo et al., 2013) highlighted the need for better defined exam constructs in relation to evaluating the suitability of accommodations. Blair and Salzberg (2007) raised an important question regarding two potential test constructs, speed and distractibility. Given that extended test time and private room accommodations are in frequent use across many health licensing programs, the authors (Blair & Salzberg, 2007) pointed out that test developers and administrators must determine if performing

under time constraints in potentially distracting environments is in any way a part of what the licensing exam is designed to measure.

There was much debate within the selected literature surrounding the use of extended time accommodations (Ingram et al., 2013; Ballard & Elwork, 2003; Blair & Salzberg, 2007; Woo et al., 2013). Moving beyond test constructs, this debate hinged on two conceptual frameworks known as differential boost and maximum potential thesis. These frameworks contend that appropriate accommodations would only benefit individuals with disabilities and not other (i.e., nondisabled) test-takers (Blair & Salzberg, 2007; Woo et al., 2013). Several authors (Blair & Salzberg, 2007; Ingram et al., 2015; Woo et al., 2013) quoted studies wherein extended test time improved the performance of all test groups, not just those requesting the accommodation due to a disability. Given this finding, Ballard and Elwork (2003) and Blair and Salzberg (2007) suggested that extended time accommodation is not a neutral event that levels the playing field, and therefore poses a threat to the exam's validity evidence as well as undermining the exam's fairness. Ingram et al. (2013) wrote that extended time accommodations may unjustly inflate test scores and result in real-world performances that are less than what would be expected given accommodated candidates' test scores. However, Woo et al. (2013) conducted a study that investigated whether nursing candidates who tested with extended time accommodations were unfairly advantaged compared to those testing under standard conditions. Using a differential item functioning analysis, the authors (Woo et al., 2013) showed that items on the national licensing exam for nurses performed largely the same for candidates with or without extended time accommodation and concluded that extended time accommodations did not threaten the fairness of that examination (2013).

McKee et al. (2016) offered a unique perspective on the appropriateness of accommodations in licensing exams. The authors argued that if it is likely that a candidate would use accommodations in professional practice, then it is a more accurate measurement of their abilities to assess the candidate with that same accommodation during his or her licensing exam. Doing so, they added, provides better protection for future patients than testing candidates with disabilities without accommodations.

Several authors (Ballard & Elwork, 2003; Gupta et al., 2005; Saladin et al., 2011) mentioned initiatives taken by some groups to improve accommodation practices for exam candidates with disabilities. For example, Saladin et al. (2011) described the process taken by

one assessment agency to help maximize test equity for candidates who are deaf and hard-of-hearing. The authors informed readers that this population may have considerable deficits in English language literacy and limited real-world and social knowledge resulting from linguistic and social isolation. The authors (Saladin et al., 2011) described a process to identify linguistically difficult test items and made recommendations to improve those items, as well as recommendations to develop guidelines for item writers (i.e., test developers) to improve future items so that they are more linguistically accessible for this particular population. The authors pointed out that these changes will improve access for many groups of test-takers, not just those with profound hearing loss. Gupta et al. (2005) suggested that testing agencies consider the principles of universal design so that tests become more accessible to all candidates, thereby eliminating the need for some candidates to request accommodations. Ballard and Elwork (2003) pointed out that if distractibility and mental processing speed were deemed unimportant to a test's construct, then all candidates could be offered extended time accommodations and minimally distracting exam settings.

Minor themes. In addition to the major themes presented above, the articles within the scoping review contained three minor themes: (a) social justice, (b) patient safety, and (c) growing accommodation needs. These themes were less explicit than the major themes, but warrant inclusion as their presence sheds light on the motivational factors underlining the above-mentioned major themes.

Social justice. Several authors (Ingram et al., 2015; Little, 2001, 2003; McKee et al., 2016) alluded to aspects of social justice in their arguments for increasing access to licensure exams through accommodations. McKee et al. (2016) argued that agencies who proscribe accommodations from licensing exams not only disregard their legislated duty, but violate the principle of social justice. Furthermore, these authors argued that diversity within the health professions workforce, accomplished by reducing barriers for candidates with exceptionalities, improves patient care for disabled populations (McKee et al., 2016). The authors (McKee et al., 2016) upheld the belief that the health professions workforce should mirror the society it serves and that inclusion of health professionals with disabilities is a matter of social justice and equity. In reference to licensure in medicine, Little (2003) insisted that medical students with learning disabilities have been subjected to "unequal and unwarranted barriers" by licensing boards' obstinate stance on accommodations (p. 188). Little (1999) argued that candidates with learning

disabilities are not asking for too much when requesting a quiet room and more time in which to take their exams. She stated that accommodation (not ability) is the only thing standing between some candidates and a successful career in the health professions (Little, 1999). Little (1999, 2003) went on to argue that students with disabilities acquire many desirable traits (e.g., compassion) as a result of their struggles with disability and that these traits assist them in their careers as health care providers.

Ingram et al. (2015) expressed concern that accommodation access is not fairly distributed. The authors (Ingram et al., 2015), drawing on multiple sources, stated that affluent white males are more likely to receive accommodations than other groups. They also commented on regional differences in the types and frequencies of disabilities diagnosed in certain jurisdictions (Ingram et al., 2015). The literature suggested that differences in early access to accommodations during education has impacts on access to accommodations in later training or licensing contexts, given the current reliance on historical accommodation records when evaluating accommodation requests at licensure.

McKee et al. (2016) argued that the language of traditional technical standards was inherently discriminatory towards students with physical and sensory disabilities. These standards pose barriers to students with disabilities when the language it contains suggests that tasks must be performed unassisted using only the faculties of the individual. The authors called for revisions to these out-dated, 'organic' technical standards in favour of newer 'functional' standards that recognize the advancements in assistive technologies and shift the focus to what students can do rather than what they can not do (McKee et al., 2016).

Patient safety. Concern for patient safety emerged as the main argument against accommodation use in health professions ETP exams. Ballard and Elwork (2003) expressed concern that some licensing boards report pressures to continue offering accommodations to unsuccessful or repeat candidates until the applicant successfully passes their examination, resulting in incompetent practitioners obtaining licensure. Blair and Salzberg (2007) stressed that the use of accommodations must be done carefully not to undermine the public's trust in licensing agencies' abilities to effectively evaluate candidates and protect the public's interest including its safety. Helms et al. (2006) suggested that patients' safety depends in part upon the information that schools share with licensing agencies regarding a student's medical and academic history, adding that there is a fine balance between upholding privacy concerns of

exam candidates and protecting patients from foreseeable risks. McKee et al. (2016), however, argued that fears of patient harm caused by physicians with disabilities are unfounded and that there is no evidence to suggest that physicians with disabilities pose any increased risks to patients.

Growing accommodation needs. Several authors (Helms, 2006; Ijiri & Kudzma, 2000; Ingram et al., 2015; Johnson, 2006; Joy et al., 2010; Newsham, 2008) reported that the numbers of students with disabilities (particularly learning disabilities) is rapidly increasing in some health professions education programs, including nursing (Ijiri & Kudzma, 2000; Helms, 2006), dentistry (Johnson, 2006), and physical therapy (Ingram et al., 2015). Despite these rising rates, McKee et al. (2016) argued that there remains an underrepresentation of students with disabilities in medical schools. Furthermore, Newsham (2008) reported that the prevalence of disability amongst students of HPE programs is considerably lower than the rate of disability observed in the general post-secondary student population. Nonetheless, the growing numbers of students requesting accommodations, and the rate at which these numbers has increased, is a growing concern for educational and licensing bodies (Joy et al., 2010).

Phase Two Results

Respondent Characteristics

I obtained 21 completed surveys, constituting a response rate of 30.9%. Due to some missing responses, however, the number of respondents for individual survey items varied. Respondents were from the three stakeholder groups: ten respondents (47.6%) identified as representatives of health regulatory bodies, nine (42.9%) identified as representatives of assessment agencies, and two (9.5%) identified as researchers/educators with an interest in accommodation use for health professionals. Many respondents (42.9%) indicated having at least 10 years of experience working with accommodations for health professionals with disabilities. Other respondents (33.3%) indicated having between five to nine years of experience, while the remainder (23.8%) reported having less than five years of experience in this area. Almost all respondents (85.7%) were from Canada while the remainder (14.3%) were from the United States of America.

Validation of Scoping Review

Stakeholders deemed the conversations (i.e., salient or recurring points of discussion) within the scholarly literature pertaining to accommodations to be of relevance. All

conversations were selected as relevant by at least 50% of the respondents. Of these, two conversations were identified as relevant by 18 of 20 respondents (90.0%). These conversations were "selecting accommodations: determining what is reasonable" and "eligibility: who qualifies for accommodation?" The conversations that ranked lowest in relevance were "accommodations for deaf or hard-of-hearing candidates," selected by 10 of 20 respondents (50.0%), and "universal test design," selected by 10 of 19 respondents (52.6%) (see Table 5 for additional details).

[Insert Table 5 here]

Fifteen of 21 respondents (71.4%) indicated that they could not think of any helpful resources pertaining to accommodation use, while six respondents (28.6%) provided examples of resources. These examples included human rights legislation, internal policies of health regulatory bodies, three articles pertaining to accommodations in post-secondary education, and an online workplace accommodation resource maintained by the U.S. Department of Labor.

Identification of Stakeholders' Challenges

The survey asked stakeholders to identify up to three of their most significant challenges related to accommodation use. From the 16 challenges (informed by the literature) presented to respondents in the survey item, 13 challenges were identified as a significant problem by respondents at least once. Of these, stakeholders most frequently selected two challenges, each selected by 8 of the 21 respondents (38.1%). These challenges were "defining disability and reasonable accommodations" and "establishing processes for accommodation requests (e.g., burden of proof, required evidence)". Other frequently selected challenges included "balancing the rights of test candidates with concerns for patient safety" (n=7; 33.3%), "separating disability and accommodation use from fitness to practice" (n=6; 28.6%), and "identifying/determining who is eligible for accommodation" (n=5; 23.8%). The three challenges not selected by any of the stakeholders surveyed included "understanding differential boost and maximum potential thesis," "gaining access to data/metrics," and "interpreting scores obtained on accommodated exams and standard setting/cut scoring" (see Table 6 for a complete ranking of the stakeholder challenges).

[Insert Table 6 here]

Preferred Areas of Research

When asked to rank five areas of research pertaining to accommodation use, stakeholders selected "legalities, disability rights, and interpreting legislation" as the most preferred area of research to address their own accommodation needs. This was followed by "establishing best practices for implementing accommodations", then "administration", then "tracking metrics and reporting findings," and lastly, "test design and psychometric principles" (see Table 7 for more details). When stakeholders were asked about specific research questions to explore in future studies, 12 of 21 respondents (57.1%) indicated that they could not think of any specific questions, while nine respondents (42.9%) provided examples of research questions that they would like to see explored in future studies. As presented in Table 8, these questions spanned a range of topics.

[Insert Tables 7 and 8 here]

Discussion

This scoping review revealed a paucity of literature on the subject of accommodation use in the licensing of health professionals with disabilities, especially in regards to empirical research on the topic. These findings are consistent with those of Blair and Salzberg (2007), who observed more than 10 years ago that the empirical research on accommodations for licensure was virtually nonexistent, and with Lovett (2010), who wrote that while there are many strong opinions on the topic, few are backed by empirical evidence. Also missing from the selected literature on accommodations in licensing exams are the voices of health professions candidates with disabilities. Collaborative research that incorporates these voices is recommended (Hargreaves et al., 2014) and should maintain a focus on improving the lives of health professionals with disabilities (Dearnley et al., 2010). Despite the lack of empirical evidence supporting accommodation use, the present study confirmed that accommodation in high-stakes testing environments continues to grow, including in health professions ETP exams. These observations are frequently reported in the broader accommodation literature (Bevan, 2014; Brinckerhoff & Banerjee, 2007; Lovett, 2010).

Based on the variety of journals publishing on this topic, accommodation for health professionals appears to be of interest to a wide-range of researchers from varying disciplines (e.g., health, law, education, disability studies, ethics). This diversity suggests that investigations and problem solving efforts for accommodation use would benefit from interdisciplinary

approaches that address the multifaceted nature of the subject. Despite the diversity in disciplines reflected in the above-mentioned literature, there was no diversity in the geographical sources of that literature, as all of the included studies came from the United States of America. This, combined with the literature's thematic emphasis on legislation (i.e., the ADA) and use of case law, may render the body of evidence to be of limited applicability outside the United States of America where legislative and regulatory climates differ. There was also an observable trend related to the legislative theme in the review. This trend played out heavily in the first chronological half of the literature. The turning point towards more practical matters coincided with amendments made to the ADA in 2008 that sought to bring greater clarity to the issue of eligibility by expanding the definitions of several key concepts within the legislation. However, this shift away from definitions in the legislation to more practical matters of accommodations is not observed everywhere, as Smith and Allen (2011) focused on the issue of defining accommodation eligibility in the medical education literature. Furthermore, feedback from Phase Two of my study suggests that stakeholders are very much interested in the topic of disability legislation.

The target audience for much of the literature identified in the scoping review was health professions educators, not ETP exam developers, administrators, or health regulators. Nonetheless, the thematic analysis revealed that the relationship between these entities is extremely important, given the relationship's consequences on candidates with disabilities and their access (or not) to accommodations throughout the training and certification trajectory. In the broader literature, Sack et al., (2008) echoed the strained relationship noted in the thematic analysis between American medical schools and the NBME and added that much work remains to close the gap between these two entities (Sack et al., 2008).

Several other areas of conversation borne out through the thematic analysis can be better understood in context of the wider literature. For example, the issues surrounding learning disabilities and ADHD were a recurring concern of test administrators and regulators in the thematic analysis. This was likewise reflected in Phase Two of the study, as 80% of stakeholders indicated that this topic was relevant to them or their organization. The broader literature confirms there has been a sharp rise in the numbers of accommodation requests on the basis of learning disabilities and ADHD within licensing contexts, which according to Sack et al. (2008) resulted from amendments to the ADA. Studies show that more than 90% of accommodations

assigned in American medical schools are for learning disabilities or ADHD (Sack et al., 2008) and 77% of accommodations granted on the Medical College Admission Test are for learning disabilities (Julian et al., 2004).

Another recurring area of concern in the thematic analysis and stakeholder consultation involved the process of diagnosing disabilities and recommending accommodations. Several stakeholders in Phase Two proposed research questions to tackle these issues (e.g., On what basis/training/evidence are physicians determining accommodations for candidates with learning disabilities? and How does a physician determine between time-and-a-half vs double time accommodations or between semi-private and private testing room accommodations?). The literature on accommodations in post-secondary education, although not specific to the health professions, may be of interest to stakeholders. Several studies (Gordon, Lewandowski, Murphy, & Dempsey, 2002; Harrison & Holmes, 2012; Lovett, 2010; Ofiesh, Hughes, & Scott, 2004) shared concerns over the lack of consistent practices used to identify candidates with disabilities, resulting in situations where some students who require accommodations do not receive them while others receive them without justifiable needs. For instance, Harrison and Holmes (2012) found that Canadian physicians lack consensus on how to best diagnose learning disabilities and urge physicians to adopt consistent, evidence-based approaches to diagnosing these disabilities. Others (Ofiesh et al., 2004) added that diagnosticians favour clinical judgments over standardized assessment measures. Gordon et al. (2002) also looked at the supporting documentation prepared by 147 clinicians that accompanied accommodation requests for the law licensing exams. They found extreme variation in the clinicians' use of diagnostic standards. When asked, 85% of these clinicians reported needing more training in this area of practice. Moreover, the broader literature commented that diagnoses, while an important aspect of determining accommodation eligibility, is of limited use in determining what accommodations should be used (Lovett, 2010; Ofiesh et al., 2004). Some authors highlighted that individuals with disabilities, even those who share a diagnosis, are not homogenous and neither are their accommodation needs (Dearnley et al., 2010; Lovett, 2010).

In Phase Two of my study, some stakeholders expressed curiosity as to how physicians determine accommodations, particularly extended time accommodations. The issue of extended time accommodation was also a significant area of conversation in the thematic analysis. In the broader literature, Weis, Dean, and Osborne (2016) reported that it is unclear how physicians

determine how much extra time is needed when making recommendations, but that 50% (time-and-a-half) is most commonly prescribed. The authors also commented that students typically use less than 25% of extra time to complete the same number of tasks as their nondisabled peers (Weis et al., 2016). This finding is consistent with Sokal and Vermette (2017), however these authors added that just because time is not used does not mean it is not needed. They explained that the presence of extra time and its effect on reducing stress result in the student not requiring most of their extended time (Sokal & Vermette, 2017). Sokal and Vermette (2017) added another unique point, suggesting that additional time needs are not fixed and that some students can gradually reduce the amount of extra time they need throughout their training. They also recommended students use other coping strategies besides accommodations to reduce the effects of their disabilities. Lovett (2010) summarized the debate surrounding the impact of extended time accommodations on validity evidence: extended time accommodations help all students to some degree (including *non*disabled students, therefore the accommodation fails to meet the maximum potential thesis) but they help students with disabilities to a greater degree (supplying some evidence of differential boost). As such, one's opinion of the fairness of extended time accommodations may depend upon one's conceptual framework for viewing the problem. Interestingly, a study by Lee, Osborne, and Carpenter (2010) observed that for post-secondary students with ADHD, extended time accommodations had no effect on their test scores; however, this population did benefit from computer-formatted exams compared to the same tests administered by paper and pencil (Lee et al., 2010).

The broader health professions literature also sheds light on the minor themes of patient safety and social justice. Walker et al. (2013) agree with the conversations in the thematic analysis that threats to patient safety are based on perceptions rather than measurable incidences of harm. Furthermore, Walker (2004) added that the increase in accommodation use in licensing contexts resulting from the ADA has had no negative impact on patient safety. The concept of social justice also takes a more dominant place outside of the licensing literature. Several authors highlighted the unique strengths of health professionals with disabilities and their increased sensitivity and insight into the needs of their patients (Bevan 2014; Hargreaves et al., 2014). Another study added that individuals with disabilities are an untapped resource capable of making valuable contributions to the healthcare workforce (Dearnley et al., 2010).

Considering the available evidence summarized in the thematic analysis and the feedback of stakeholders from Phase Two, I can delineate several gaps within the literature concerning accommodations which point to future avenues of research. First, studies are needed to assist stakeholders to better interpret disability-related legislation, particularly in the Canadian context. Based on stakeholder feedback, these studies should focus specifically on defining disability as well as determining best practices for accommodation eligibility and assigning reasonable accommodations. Another useful area for future study involves increasing transparency of accommodation practices, including physicians' criteria for recommending accommodations (particularly extended time accommodations) as well as licensing boards' accommodation practices and metrics for the benefit of candidates and educators; these studies would help reduce the gap between stakeholder entities, namely education and licensure. Other studies should empirically explore accommodations for exam candidates with cognitive disabilities and the effects of accommodations on patient safety. Lastly, researchers should consider a multidisciplinary approach that incorporates the perspectives of non-health professionals such as lawyers, educators, disability experts, etc. In addition, researchers should include health professionals with disabilities as research collaborators, as their perspectives have been excluded in the scholarly literature thus far.

Limitations

While I created a comprehensive search strategy for this study, it is possible that I did not identify all relevant literature regarding accommodations in health licensing contexts. Different search terms or databases from the ones I selected may have yielded different studies. In addition, I limited my scoping review to articles that were available in the English language; this limitation did result in my exclusion of one study at the time of full-text screening as it could not be sourced in English. Similarly, I administered the stakeholder survey in English (though all stakeholders were recruited through English-language websites and there were no indications that English posed a barrier to participation). I also did not include professionals with disabilities in the stakeholder consultation. I suspect that the perspectives of this group would be of great value to inform future accommodation practices, but I was unable to identify or recruit this population in a feasible manner. Lastly, the response rate for this survey may be a limitation. While it falls within the normal ranges reported in the survey literature, particularly for the health

professions (Church & Waclawski, 1998; Hill, Fahrney, Wheeless, & Carson, 2006), a larger number of responses may have affected the results of Phase Two of this study.

Conclusion

This study begins to fill a gap in our understanding of the available evidence supporting accommodation use within health professions licensing programs. The scoping review confirms that there is a dearth of literature to inform accommodation practices in high-stakes examinations, particularly empirical studies on the measureable effects of accommodations on the psychometric properties of validity and reliability. This study shows that accommodation use in health licensing contexts is of interest to a range of disciplines beyond the health professions, including law, ethics, and disability studies, suggesting that a multidisciplinary approach to future problem-solving efforts may be productive. This study also revealed that health professions stakeholders, including licensing agencies and regulators, share many concerns regarding the interpretation of antidiscrimination legislation as well as concerns with assigning and implementing accommodations in licensing examinations.

As such, this study lays the groundwork to pursue future research activities informed by the gaps in the scholarly literature as well as the challenges and needs of stakeholders. First, studies are needed to address stakeholders' expressed needs for improved understanding of antidiscrimination legislation, including the definitions of disability and reasonable accommodation under the law. Second, empirical research, such as psychometric-based studies using real exam data, is needed to inform accommodation practices that uphold the foundational psychometric properties of validity, reliability, and fairness. For this purpose, researchers might engage stakeholders, such as testing agencies, to co-produce research supporting these aims. Third, research is needed to establish consistent practices for implementing accommodations, particularly regarding the assignment of extended time accommodations for students with cognitive disabilities. Lastly, researchers should engage health professionals with disabilities, either as co-investigators or as study participants, to introduce an important and missing perspective into the scholarly literature regarding accommodation use. Such future research would not only support fair and consistent accommodation practices for those with disabilities, but also provide greater certainty to the public that all health care providers have been adequately evaluated and are capable of delivering safe and effective care.

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Tables

Table 1

Ovid/Medline Search Strategy (for identifying articles for the scoping review)

Assessment Domain
1. exp Credentialing/
2. credential*.tw.
3. Accreditation/
4. accredit*.tw.
5. exp Certification/
6. certif*.tw.
7. exp Licensure/
8. licens*.tw.
9. exp Specialty Boards/
10. specialty board*.tw.
11. exp Educational Measurement/
12. registration* exam*.tw.
13. entr* exam*.tw.
14. qualif* exam*.tw.
15. certification* exam*.tw.
16. licens* exam*.tw.
17. board exam*.tw.

Accommodation Domain
18. exam* accommodation*.tw.
19. accommodation*.tw.
20. exam* modification*.tw.
21. adaptation*.tw.
22. modification*.tw.

Profession Domain
23. exp Health Personnel/
24. healthcare provider*.tw.
25. health care provider*.tw.
26. healthcare personnel*.tw.
27. health care personnel*.tw.
28. exp Allied Health Personnel/
29. Audiology/
30. audiolog*.tw.
31. Speech-Language Pathology/
32. speech language patholog*.tw.
33. Podiatry/
34. podiatr*.tw.
35. chiropod*.tw.
36. Chiropractic/
37. chiropract*.tw.
38. Dental Hygienists/
39. dental hygien*.tw.
40. exp Technology, Dental/
41. dental technolog*.tw.
42. exp Dentistry/
43. dentist*.tw.
44. Denturists/
45. denturis*.tw.
46. Dietetics/
47. dietitian*.tw.
48. nutritionist*.tw.
49. Homeopathy/
50. homeopath*.tw.
51. kinesiolog*.tw.
52. Massage/
53. massage therap*.tw.
54. Medical Laboratory Science/
55. medical laboratory techn*.tw.
56. Technology, Radiologic/
57. medical radiation techn*.tw.
58. exp Medicine/
59. exp Education, Medical/
60. medical education.tw.
61. exp Physicians/
62. doctor*.tw.
63. physician*.tw.
64. Midwifery/
65. midwi*.tw.
66. Naturopathy/
67. naturopath*.tw.
68. exp Nursing/
69. nurs*.tw.
70. exp Education, Nursing/
71. nurs* education.tw.
72. Occupational Therapy/
73. occupational therap*.tw.
74. exp Optometry/
75. optometr*.tw.
76. optician*.tw.
77. Pharmacy/
78. pharmacy.tw.
79. Medical Laboratory Personnel/
80. Pharmacists/
81. pharmacist*.tw.
82. Physical Therapists/
83. physical therap*.tw.
84. physiotherap*.tw.
85. psycholog*.tw.
86. Respiratory Therapy/
87. respiratory therap*.tw.
88. Medicine, Chinese Traditional/
89. traditional Chinese medicine.tw.
90. Acupuncture/
91. acupunctur*.tw.
92. exp Health Occupations/
93. health occupation*.tw.

Assessment Domain (or)
94. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17

Accommodation Domain (or)
95. 18 or 19 or 20 or 21 or 22

Profession Domain (or)
96. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93

Domains combined (and)
97. 94 and 95 and 96

Domains filtered for humans
98. limit 97 to humans

Table 2
Inclusion and Exclusion Criteria (for screening articles in the scoping review)

	Inclusion criteria	**Exclusion criteria**
Field/Discipline	all health professions eligible	study focuses on a non-health-related profession
Accommodation & Disability	all types of accommodations for all disabilities eligible	study does not involve accommodation or involves accommodation for non-disability-related needs
Setting	entry-to-practice, licensing, or certification exams	study focuses exclusively on workplace or classroom-based accommodations
Publication date	1990 onwards	prior to 1990
Language	study is published in English	study is published in a language other than English

Table 3
Stakeholder Groups (for Phase Two)

Profession	**Stakeholder group #1: Regulators**	**Stakeholder group #2: Testing Agencies**
Audiology & Speech-Language Pathology	College of Audiologists and Speech-Language Pathologists of Ontario	Speech-Language & Audiology Canada
Chiropody (Podiatry)	College of Chiropodists of Ontario	College of Chiropodists of Ontario
Chiropractic	College of Chiropractors of Ontario	Canadian Chiropractic Examining Board
Dental Hygiene	College of Dental Hygienists of Ontario	National Dental Hygiene Certification Board
Dental Technology	College of Dental Technologists of Ontario	College of Dental Technologists of Ontario
Dentistry	Royal College of Dental Surgeons of Ontario	National Dental Examining Board of Canada
Denturism	College of Denturists of Ontario	College of Denturists of Ontario
Dietetics	College of Dietitians of Ontario	Alliance of Canadian Dietetic Regulatory Bodies
Homeopathy	College of Homeopaths of Ontario	College of Homeopaths of Ontario
Kinesiology	College of Kinesiologists of Ontario	College of Kinesiologists of Ontario
Massage Therapy	College of Massage Therapists of Ontario	College of Massage Therapists of Ontario
Medical Laboratory Technology	College of Medical Laboratory Technologists of Ontario	Canadian Society for Medical Laboratory Science
Medical Radiation Technology	College of Medical Radiation Technologists of Ontario	Canadian Association of Medical Radiation Technologists
Medicine	College of Physicians and Surgeons of Ontario	Medical Council of Canada Royal College of Physicians and Surgeons of Canada College of Family Physicians of Canada
Midwifery	College of Midwives of Ontario	Canadian Midwifery Regulators Council
Naturopathy	College of Naturopaths of Ontario	North American Board of Naturopathic Examiners
Nursing	College of Nurses of Ontario	National Council of State Boards of Nursing
Occupational Therapy	College of Occupational Therapists of Ontario	Canadian Association of Occupational Therapists
Opticianry	College of Opticians of Ontario	National Association of Canadian Optician Regulators
Optometry	College of Optometrists of Ontario	Optometry Examining Board of Canada
Pharmacy	Ontario College of Pharmacists	Pharmacy Examining Board of Canada
Physiotherapy	College of Physiotherapists of Ontario	Canadian Alliance of Physiotherapy Regulators
Psychology	College of Psychologists of Ontario	Association of State and Provincial Psychology Boards
Psychotherapy	College of Registered Psychotherapists of Ontario	COMPASS Centre for Examination Development
Respiratory Therapy	College of Respiratory Therapists of Ontario	Canadian Board for Respiratory Care
Traditional Chinese Medicine	College of Traditional Chinese Medicine Practitioners and Acupuncturists of Ontario	Canadian Alliance of Regulatory Bodies of Traditional Chinese Medicine Practitioners and Acupuncturists
Stakeholder group #3: Researchers/Educators (corresponding authors identified in the scoping review)		

Table 4
Data Extraction and Charting Form (for Phase One)

Author (year), location	Publication type	Purpose	Profession & Disability	Theme(s)
Little (1999), USA	Commentary	• To discuss the NBME's denial of accommodation requests on grounds of no previous history of accommodation use • To discuss timed testing in relation to learning disabilities	Medicine & Learning disabilities	• Interpreting legislation • Administration & process • Social justice
Ijiri & Kudzma (2000)	Commentary*	• To discuss learning disabilities within nursing education programs • To discuss forced choice testing and computer adaptive testing in relation to students with learning disabilities	Nursing & Learning disabilities	• Interpreting legislation • Administration & process • Psychometrics & test development • Growing accommodations needs
Little (2003), USA	Commentary	• To discuss case law in light of NBME's denial of accommodation requests on grounds of learning disabilities	Medicine & Learning disabilities	• Interpreting legislation • Alignment between education & licensure • Social justice
Hafferty & Gibson (2003), USA	Commentary*	• To challenge (in response to Little, 2003) the usefulness of generalizing outcomes of accommodation case law • To discuss the purpose of medical education	Medicine & Learning disabilities	• Interpreting legislation • Alignment between education & licensure
Ballard & Elwork (2003), USA	Commentary	• To discuss accommodations for candidates with learning disabilities in licensing contexts including medicine	Medicine[§] & Learning disabilities	• Interpreting legislation • Administration & process • Alignment between education & licensure • Psychometrics & test development • Social justice • Patient safety
Gupta, Gelpi, & Sain (2005), USA	Commentary*	• To discuss accommodations and essential job functions in occupational therapy, including a brief description of the profession's national exam	Occupational Therapy & Nonspecific	• Interpreting legislation • Administration & process • Alignment between education & licensure • Psychometrics & test development
Johnson (2006), USA	Empirical	• To examine the frequency and types of accommodations granted at dental licensing exams	Dentistry & Nonspecific	• Alignment between education & licensure • Growing accommodation needs
Helms, Jorgensen, & Anderson (2006), USA	Commentary*	• To discuss disability legislation and its implications for nursing, including the issue of student privacy	Nursing & Nonspecific	• Interpreting legislation • Alignment between education & licensure • Patient safety • Growing accommodation needs

Author (year), location	Publication type	Purpose	Profession & Disability	Theme(s)
Blair & Salzberg (2007), USA	Commentary	• To review the legal and policy background as well as education literature relevant to accommodations in licensure • To pose a series of policy and implementation questions for licensing bodies	Medicine[§] & Nonspecific	• Interpreting legislation • Administration & process • Psychometrics & test development • Patient safety
Newsham (2008), USA	Commentary*	• To discuss disability legislation and its implications on allied health professions education & licensure	Nonspecific	• Interpreting legislation • Alignment between education & licensure • Growing accommodation needs
Joy, Julius, Akter, & Baron (2010), USA	Empirical	• To review the documentation submitted to the National Board of Osteopathic Medical Examiners supporting accommodation requests on the basis of ADHD	Medicine (Osteopathy) & ADHD	• Administration & process • Growing accommodation needs
Saladin, Reid, & Shiels (2011), USA	Commentary	• To describe a process for maximizing test equity for deaf or hard-of-hearing exam candidates	Rehabilitation Counselling & Deaf or HOH	• Administration & process • Psychometrics & test development
Woo, Hagge, & Dickison (2013), USA	Empirical	• To investigate whether NCLEX-RN candidates with extended test time accommodation had an unfair advantage over candidates in standard conditions	Nursing & Nonspecific	• Psychometrics & test development
Ingram, Mohr, & Mabey (2015), USA	Commentary*	• To discuss learning disabilities and accommodations in physical therapy education and licensing	Physical Therapy & Learning disabilities	• Administration & process • Alignment between education & licensure • Psychometrics & test development •Social justice • Growing accommodation needs
McKee, Case, Fausone, Zazove, Ouellette, & Fetters (2016), USA	Commentary*	• To discuss accommodations for physical and sensory disabilities in relation to technical standards	Medicine & Sensory and Physical disabilities	• Psychometrics & test development • Social justice • Patient safety • Growing accommodation needs

*Article focuses on accommodations in health professions education but makes reference to licensing concerns or contains a licensure subsection.

[§]Article discusses a health professions discipline as well as a non-health-related profession (e.g., law).

Table 5
Relevance of Scholarly Literature (according to Stakeholder feedback from Phase Two)

Relevance of conversations in the scholarly literature	**N**	**Relevant***	**Irrelevant§**	**Neutral/ No Opinion**
		n (%)		
Selecting accommodations: determining what is reasonable	**20**	18 (90.0%)	1 (5.0%)	1 (5.0%)
Eligibility: Who qualifies for accommodation?	**20**	18 (90.0%)	1 (5.0%)	1 (5.0%)
Requesting accommodations: What should be asked? What "proof" is required?	**20**	17 (85.0%)	1 (5.0%)	2 (10.0%)
Gaps between stakeholders: how accommodation use differs between educational institutions and licensing agencies	**20**	16 (80.0%)	1 (5.0%)	3 (15.0%)
Interpreting the legalities of discrimination, disclosure, privacy, and the duty to accommodate	**20**	16 (80.0%)	1 (5.0%)	3 (15.0%)
Accommodations for attention deficit hyperactivity disorder (ADHD), mental health conditions, or learning disabilities	**20**	16 (80.0%)	2 (10.0%)	2 (10.0%)
Disability and fitness to practice: accommodations resulting in terms, conditions or limitations	**20**	14 (70.0%)	2 (10.0%)	4 (20.0%)
Relationship between essential job functions or technical standards and accommodation use	**19**	13 (68.4%)	1 (5.3%)	5 (26.3%)
Benefits of diversity within the health professions (benefit to patients and professionals)	**20**	13 (65.0%)	2 (10.0%)	5 (25.0%)
Concerns around the lack of available data regarding numbers and types of accommodation requests, types of accommodations granted, and passing rates for accommodated exams	**20**	13 (65.0%)	1 (5.0%)	6 (30.0%)
Fears that accommodations may impact patient safety by masking deficiencies in essential job requirements	**20**	13 (65.0%)	1 (5.0%)	6 (30.0%)
Universal test design	**19**	10 (52.6%)	2 (10.2%)	7 (36.8%)
Accommodations for deaf or hard-of-hearing candidates	**20**	10 (50.0%)	4 (20.0%)	6 (30.0%)
*This category combines "Relevant" and "Completely relevant" responses §This category combines "Irrelevant" and "Completely irrelevant" responses				

Table 6
Stakeholder Challenges (N=21)

Stakeholder challenges related to accommodation use in entry-to-practice examinations for health professionals	n (%)*
Defining "disability" and "reasonable accommodations"	8 (38.1%)
Establishing processes for accommodation requests (burden of proof, required evidence)	8 (38.1%)
Balancing the rights of test candidates with concerns for patient safety	7 (33.3%)
Separating disability and accommodation use from fitness to practice	6 (28.6%)
Identifying/determining who is eligible for accommodation	5 (23.8%)
Implementing/operationalizing accommodations	4 (19.0%)
Monitoring and responding to risks (potential discrimination/ableism/litigation)	4 (19.0%)
Finding appropriate resources to inform decision-making	4 (19.0%)
Maintaining foundational psychometric properties (fairness, validity, reliability, standardization)	3 (14.3%)
Matching the right accommodation to the right candidate	2 (9.5%)
Applying principles of inclusive/universal test design	2 (9.5%)
Navigating matters of confidentiality, privacy, and (non)disclosure	1 (4.8%)
Managing candidate expectations	1 (4.8%)
Other (please specify): Matching accommodations offered during academic studies to actual individual needs of candidates	1 (4.8%)
Understanding differential boost and maximum potential thesis	0
Gaining access to data/metrics (prevalence of requests, types of accommodations granted, etc.)	0
Interpreting scores obtained on accommodated exams and standard setting/cut scoring	0
*n will not equal 21 as respondents could select up to three options each	

Table 7
Preferred Areas of Research (N=20)

Preferred areas of research (displayed in order of preference)	1 *(most preferred)*	2	3	4	5 *(least preferred)*
	n (%)				
Legalities, disability rights, and interpreting legislation	10 (50.0%)	3 (15.0%)	3 (15.0%)	3 (15.0%)	1 (5.0%)
Establishing best practices for implementing accommodations	6 (30.0%)	12 (60.0%)	1 (5.0%)	1 (5.0%)	0
Administration (application processes, managing requests, assigning accommodations)	2 (10.0%)	4 (20.0%)	9 (45.0%)	2 (10.0%)	3 (15.0%)
Tracking metrics/statistics and reporting findings	1 (5.0%)	0	4 (20.0%)	10 (50.0%)	5 (25.0%)
Test design and psychometric principles (ensuring validity, reliability, and fairness)	1 (5.0%)	1 (5.0%)	3 (15.0%)	4 (20.0%)	11 (55.0%)

Note: Shaded cells indicate the preferred rank for each area of research

Table 8
Stakeholders' Research Questions

Stakeholders' suggested research questions
• On what basis/training/evidence are physicians determining accommodations for candidates with learning disabilities? • How does a physician determine between time-and-a-half vs double time accommodations or between semi-private and private testing room accommodations? • How effective are current accommodations for students with various types of disabilities? • How are extended time accommodations determined? • How likely are students who receive accommodations throughout training to pass exams on their first attempt? • Is test anxiety or general anxiety disorder eligible for accommodation? • How are accommodated exam candidates coping in real-world practice? • How many accommodations are requested vs granted? What types? • How many denied accommodation requests result in human rights complaints? • Should accommodation requests on grounds of preventing illness be granted? • What tools can be developed to support accommodation processes such as requests?

Figures

Figure 1
Study Screening and Selection Flowchart

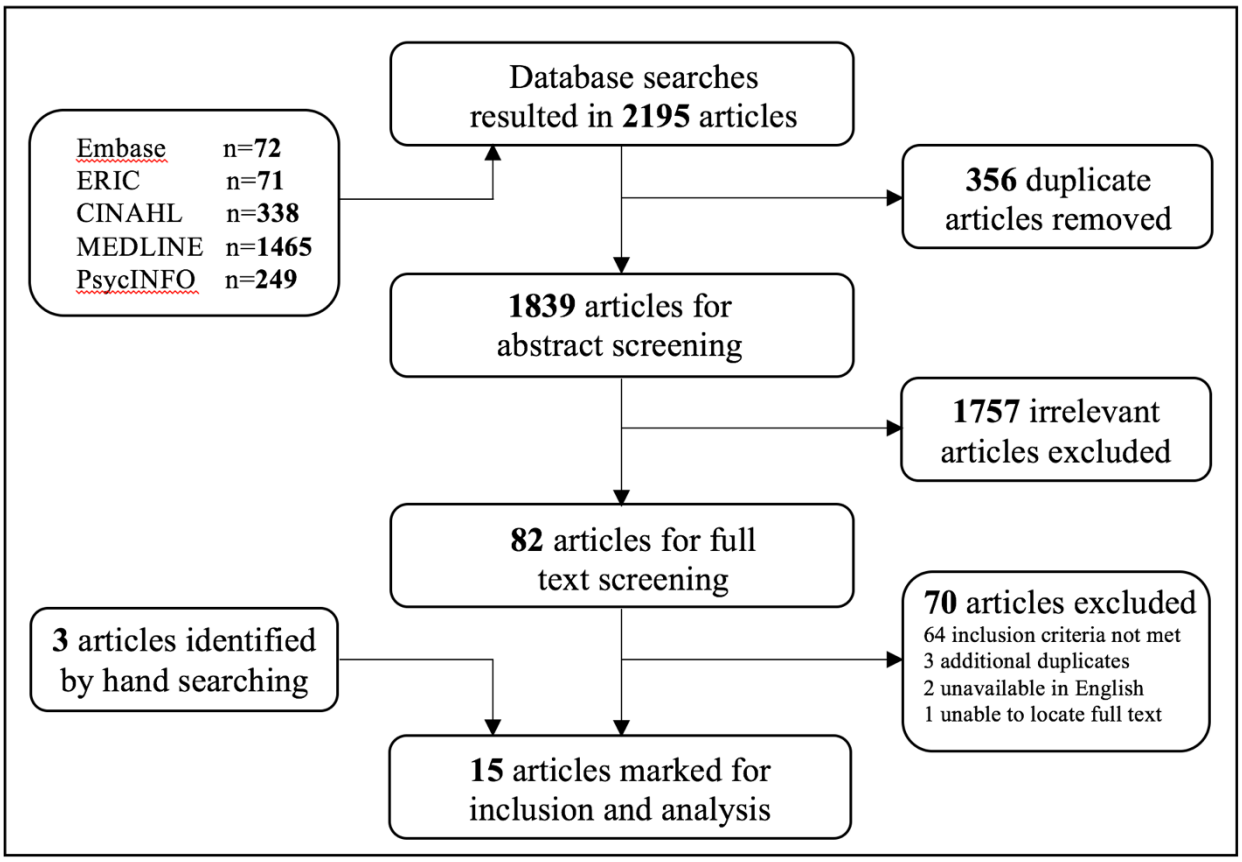
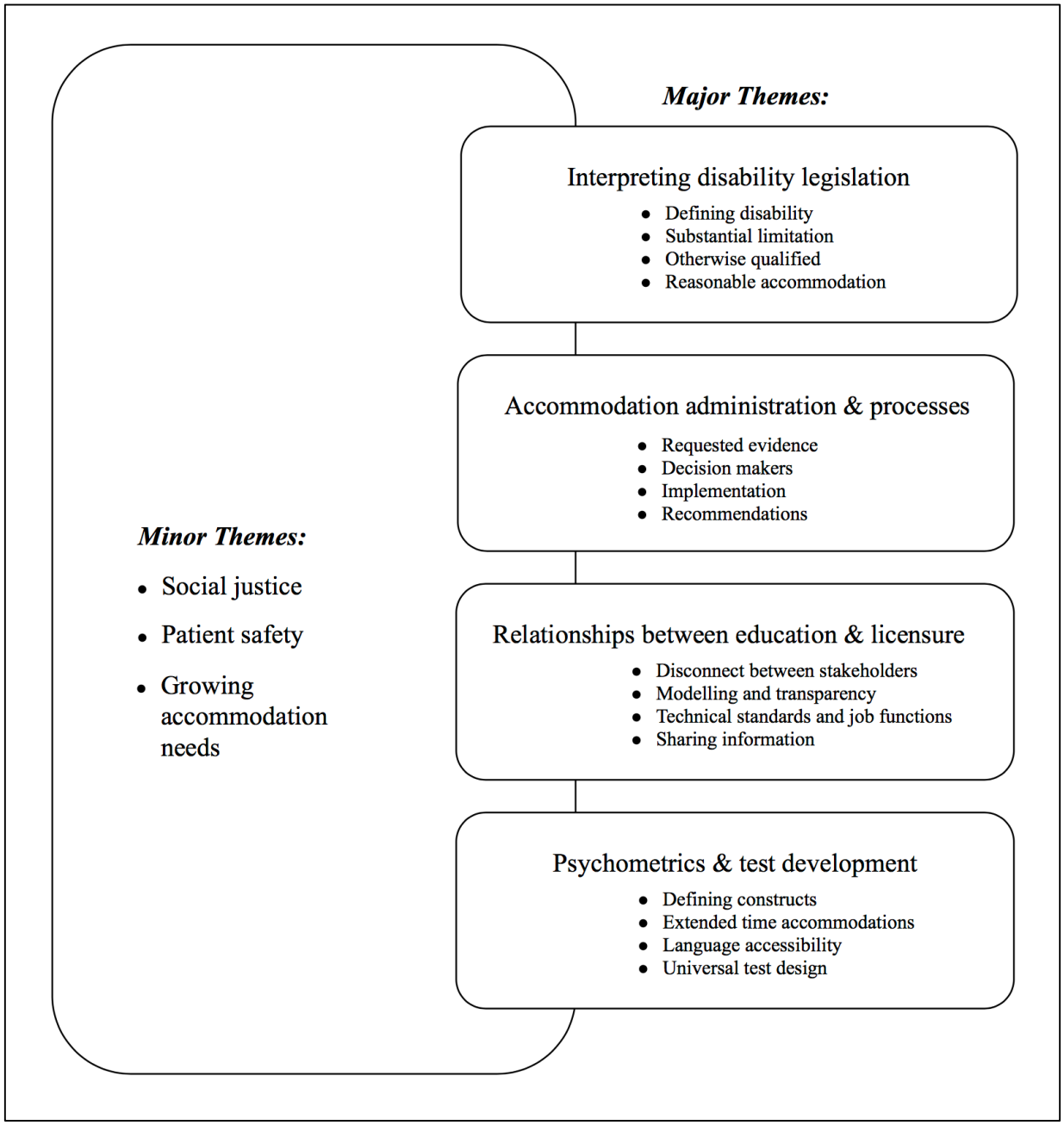


Figure 2
Thematic Structure (emergent themes from the scoping review)



Appendix A

Stakeholder Consultation Survey

Thank you for your interest in this study.

The following survey should take approximately 5-8 minutes of your time to complete.

For the purpose of this survey, "accommodation use" refers to the use of accommodations (e.g., extended test time, interpreters, alterations to the physical environment, etc.) in the assessment of health professions candidates at entry-to-practice or licensing examinations. We are interested in accommodations assigned for candidates with temporary or permanent disabilities (e.g., chronic or acute health conditions, physical impairments, sensory deficits, learning disabilities, cognitive disabilities, etc.).

1. Which of the following stakeholder groups do you primarily represent? (Select one)

- I represent a health regulatory body (i.e., registrar or delegate of a regulatory college)
- I represent a certification program or assessment agency tasked with developing and/or administering entry-to-practice examinations for a health profession
- I am an author, researcher and/or educator with an interest in accommodation use for health professionals with disabilities
- I do not represent any of these groups [skip logic – end survey]

2. From your perspective, what are the most significant challenges related to accommodation use in entry-to-practice examinations for health professionals? (You may select up to three options)

- Applying principles of inclusive/universal test design
- Balancing the rights of test candidates with concerns for patient safety
- Defining "disability" and "reasonable accommodations"
- Establishing processes for accommodation requests (burden of proof, required evidence)
- Finding appropriate resources to inform decision-making
- Gaining access to data/metrics (prevalence of requests, types of accommodations granted, etc.)
- Identifying/determining who is eligible for accommodation
- Implementing/operationalizing accommodations
- Interpreting scores obtained on accommodated exams and standard setting/cut scoring
- Maintaining foundational psychometric properties (fairness, validity, reliability, standardization)
- Managing candidate expectations
- Monitoring and responding to risks (potential discrimination/ableism/litigation)
- Matching the right accommodation to the right candidate
- Navigating matters of confidentiality, privacy, and (non)disclosure
- Separating disability and accommodation use from fitness to practice
- Understanding differential boost and maximum potential thesis
- Other (please specify)

3. What general areas of research would best address your needs (or your organization's needs) when it comes to accommodation use in the assessment of health professionals? Please rank (by clicking and dragging) the following areas of research from 1 to 5 where 1 = most preferred and 5 = least preferred.

- Legalities, disability rights, and interpreting legislation
- Tracking metrics/statistics and reporting findings
- Establishing best practices for implementing accommodations
- Test design and psychometric principles (ensuring validity, reliability, and fairness)
- Administration (application processes, managing requests, assigning accommodations)

4. Are there any specific questions regarding accommodation use that you or your organization would want researchers to answer through future studies?

- No, none that I can think of at this time
- Yes (please specify)

Researchers recognize there is often disconnect between the conversations happening in the scholarly literature and the needs and opinions of stakeholders actively involved in the field. A recent literature review was conducted to describe the research activity involving accommodation use for health professionals at entry-to-practice examinations. The dominant conversations in that body of scholarly literature are presented in the question below.

5. To what extent do you think these conversations in the scholarly literature are relevant to you or your organization? (For each item, please indicate on a scale of "Completely irrelevant" to "Completely relevant" or select "Neutral/No opinion")

- Accommodations for attention deficit hyperactivity disorder (ADHD), mental health conditions, or learning disabilities
- Accommodations for deaf or hard-of-hearing candidates
- Benefits of diversity within the health professions (benefit to patients and professionals)
- Concerns around the lack of available data regarding numbers and types of accommodation requests, types of accommodations granted, and passing rates for accommodated exams
- Disability and fitness to practice: accommodations resulting in terms, conditions or limitations
- Eligibility: Who qualifies for accommodation?
- Fears that accommodations may impact patient safety by masking deficiencies in essential job requirements
- Gaps between stakeholders: how accommodation use differs between educational institutions and licensing agencies
- Interpreting the legalities of discrimination, disclosure, privacy, and the duty to accommodate
- Relationship between essential job functions or technical standards and accommodation use

- Requesting accommodations: What should be asked? What "proof" is required?
- Selecting accommodations: determining what is reasonable
- Universal test design

6. A goal of this study is to identify resources that can inform sound decision-making involving accommodation use in the assessment of health professionals. Are there any particular resources (e.g., studies, policies, articles, books, etc.) that have been helpful for you or your organization regarding accommodations?

- None that I can think of at this time
- Yes, I am aware of helpful resources (please specify)

For publication purposes, we are asking demographic questions in order to describe the population surveyed. We will only be reporting aggregate data and your identity (including any organization you represent) will in no way be linked to published findings.

7. For how many years have you been working in a position that exposes you to matters involving accommodations for the assessment of health professionals with disabilities?

- Less than 5 years
- 5-9 years
- 10-14 years
- 15-19 years
- 20 years or more
- I prefer not to say

8. In which country do you work?

- Canada
- United Kingdom
- United States of America
- Other (please specify)
- I prefer not to say

We thank you for your time spent taking this survey. Your response has been recorded.

Appendix B

University of Ottawa Certificate of Ethics Approval

04/06/2018

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

Numéro du dossier / Ethics File Number	S-04-18-401
Titre du projet / Project Title	Accommodations in the Assessment of Health Professionals at Entry-to-Practice: A Scoping Review
Type de projet / Project Type	Thèse de maîtrise / Master's thesis
Statut du projet / Project Status	Approuvé / Approved
Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)	04/06/2018
Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)	03/06/2019

Équipe de recherche / Research Team

Chercheur / Researcher	Affiliation	Role
Dennis NEWHOOK	Faculté d'éducation / Faculty of Education	Chercheur Principal / Principal Investigator
Katherine MOREAU	Faculté d'éducation / Faculty of Education	Superviseur / Supervisor

Conditions spéciales ou commentaires / Special conditions or comments

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04/06/2018

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Le Comité d'éthique de la recherche (CÉR) de l'Université d'Ottawa, opérant conformément à l'*Énoncé de politique des Trois conseils* (2014) et toutes autres lois et tous règlements applicables, a examiné et approuvé la demande d'éthique du projet de recherche ci-nommé.

L'approbation est valide pour la durée indiquée plus haut et est sujette aux conditions énumérées dans la section intitulée "Conditions Spéciales ou Commentaires". Le formulaire « Renouvellement ou Fermeture de Projet » doit être complété quatre semaines avant la date d'échéance indiquée ci-haut afin de demander un renouvellement de cette approbation éthique ou afin de fermer le dossier.

Toutes modifications apportées au projet doivent être approuvées par le CÉR avant leur mise en place, sauf si le participant doit être retiré en raison d'un danger immédiat ou s'il s'agit d'un changement ayant trait à des éléments administratifs ou logistiques du projet. Les chercheurs doivent aviser le CÉR dans les plus brefs délais de tout changement pouvant augmenter le niveau de risque aux participants ou pouvant affecter considérablement le déroulement du projet, rapporter tout évènement imprévu ou indésirable et soumettre toute nouvelle information pouvant nuire à la conduite du projet ou à la sécurité des participants.

The University of Ottawa Research Ethics Board, which operates in accordance with the *Tri-Council Policy Statement* (2014) and other applicable laws and regulations, has examined and approved the ethics application for the above-named research project.

Ethics approval is valid for the period indicated above and is subject to the conditions listed in the section entitled "Special Conditions or Comments". The "Renewal/Project Closure" form must be completedfour weeks before the above-referenced expiry date to request a renewal of this ethics approval or closure of the file.

Any changes made to the project must be approved by the REB before being implemented, except when necessary to remove participants from immediate endangerment or when the modification(s) only pertain to administrative or logistical components of the project. Investigators must also promptly alert the REB of any changes that increase the risk to participant(s), any changes that considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project or the safety of the participant(s).

Germain ZONGO
Responsable d'éthique en recherche / Protocol Officer
Pour/For **Barbara GRAVES** Président(e) du/ Chair of the **Comité d'éthique de la recherche en sciences sociales et humanités / Social Sciences and Humanities Research Ethics Board**

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Appendix C

Survey Table of Specifications

Initial Research Questions	Survey Section	Survey Questions
	a. Screening	**1. Which of the following stakeholder groups do you primarily represent?**
Research Question 2: What future programs of research would address stakeholders' concerns about the use of accommodations in the assessment of regulated health professionals? ***Required surveying stakeholders***	b. Identification of stakeholders' challenges	**2. From your perspective, what are the most significant challenges related to accommodation use in entry-to-practice examinations for health professionals?**
	c. Identification & prioritization of future research	**3. What general areas of research would best address your needs (or your organization's needs) when it comes to accommodation use for health professionals?** **4. Are there any specific questions regarding accommodation use that you or your organization would want researchers to answer through future studies?**
Research Question 1: What is the current state of literature on accommodation use in the assessment of regulated health professionals? ***Required scoping the literature plus stakeholder consultation (survey) to validate findings, identify further resources, and identify research gaps***	d. Validation of scoping review	**5. To what extent do you think these conversations in the scholarly literature are relevant to you or your organization?** **6. A goal of this study is to identify resources that can inform sound decision-making involving accommodation use in the assessment of health professionals. Are there any particular resources (e.g., studies, policies, articles, books, etc.) that have been helpful for you or your organization regarding accommodations?**
	e. Respondent characteristics (combined with screening survey question #1)	**7. For how many years have you been working in a position that exposes you to matters involving accommodations for the assessment for health professionals with disabilities?** **8. In which country do you work?**

Appendix D

Survey Invitation Email

Dear Stakeholder,

You are invited to participate in a brief survey for a study on accommodation use in the assessment of health professionals at entry-to-practice examinations. This study is being conducted by Dennis Newhook, a master's candidate in the field of Health Professions Education at the University of Ottawa. To access the survey, please visit: [Stakeholder Survey Link]

The survey seeks stakeholder feedback to a) identify the resources used to inform accommodation practices, b) identify areas of concern regarding accommodation use in standardized examinations, and c) prioritize directions for future programs of research so that the most pressing needs of stakeholders are addressed.

For additional information, please see the attached study information letter.

If for any reason you are unable to complete the survey at this time, you may forward this invitation to a knowledgeable representative on this topic at your institution to complete the survey on your behalf. If you are a registrar of a regulatory college that administers its own examination, please be aware that someone in your examination department will also receive this survey invitation as a separate stakeholder group (test administrators). Registrars (or their delegates) should complete this survey as representatives of the regulator stakeholder group.

If you have any questions or require further information, you may contact the Principal Investigator, Dennis Newhook, by email at [redacted] or the supervising professor, Dr. Katherine Moreau, at [redacted].

Thank you in advance for your participation.

Appendix E

Study Information Letter

uOttawa

Université d'Ottawa
Faculté d'éducation

University of Ottawa
Faculty of Education

Information Letter

Title of the study: Accommodations in the Assessment of Health Professionals at Entry-to-Practice: A Scoping Review

Principal Investigator: Dennis Newhook
Health Professions Education (Master's Candidate)
Faculty of Education
University of Ottawa
Ottawa, ON
[redacted]

Supervising Professor: Dr. Katherine Moreau
Assistant Professor
Faculty of Education
University of Ottawa
Ottawa, ON
[redacted]

Invitation to Participate: You are invited to participate in the abovementioned research study conducted by Dennis Newhook under the supervision of Dr. Katherine Moreau.

Participation: If you wish to participate in this study, please complete the online survey by clicking on the survey link in this email. Your decision to complete and submit this survey will be interpreted as an indication of your consent to participate. The survey should take you approximately 5 to 8 minutes to complete. You do not have to answer any questions that you do not want to answer. Once you have completed the survey, please submit it by clicking the submit button at the end of the survey. You will have until July 10, 2018 to complete and submit the survey. To remind you about the survey, I will send two email reminders over the four-week study period.

Purpose of the Study:

- Phase 1 (Scoping Review): sought to identify the resources used to inform evidence-based decision-making regarding the use of accommodations in entry-to-practice certification/licensing examinations for health professionals with disabilities;
- Phase 2 (Stakeholder Survey): aims to a) validate the findings of Phase 1; b) identify stakeholders' areas of concerns regarding accommodation use; c) prioritize directions for future programs of research so that the most pressing needs of stakeholders are addressed.

The study seeks participation from three stakeholder groups:

- Provincial regulatory bodies (i.e., Colleges) of Ontario's 26 regulated health professions
- Assessment agencies responsible for the entry-to-practice (or specialty) exams for Ontario's 26 regulated health professions
- Researchers/Educators identified as the corresponding authors of the articles included in Phase 1 of the study

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Information Letter continued

Benefits: Stakeholders will not immediately benefit from this study. However, the results from this study may indirectly inform policy or practices affecting accommodation use for health professions candidates with disabilities. The findings of the study may contribute to initiatives to improve accessibility and reduce barriers to regulated health professions. Stakeholder participation may also inform future research activities by highlighting the gaps in the scholarly literature and by making the needs and concerns of stakeholders known.

Confidentiality and Anonymity: All information you share will remain strictly confidential and will be used solely for the purposes of this study. The only people who will have access to the research data are Dennis Newhook and Dr. Katherine Moreau. In order to minimize the risk of security breaches and to help ensure your confidentiality, we recommend that you use standard safety measures such as signing out of your computer account, closing your browser, and locking your screen or device when you are no longer using them and/or when you have completed the survey. Results will be published in pooled (aggregate) format so that participants are not identifiable.

Conservation of Data: The research data will be stored in a password protected file, on a password protected computer in the locked office of Dr. Katherine Moreau at the University of Ottawa for a period of 5 years at which time the data will be securely deleted.

Compensation: You will receive no compensation for participating in this study.

Voluntary Participation: You are under no obligation to participate and if you choose to participate, you may refuse to answer questions that you do not want to answer. Completion and submission of the survey by you implies consent. You may later choose to withdraw from the study (by contacting the Principal Investigator, Dennis Newhook) without undergoing any negative consequences. In this case, your data will be removed from the study analysis and securely destroyed.

Information about the Study Results: If you are interested in receiving a summary of the study results, you may contact Dennis Newhook, Principal Investigator at the email address herein.

If you have any questions or require further information about the study, you may contact Dennis Newhook, Principal Investigator at the email address herein.

If you have any questions with regards to the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5, tel.: (613) 562-5387 or ethics@uottawa.ca.

Please keep this form for your records.

Thank you for your time and consideration.

Mr. Dennis Newhook: June 11, 2018 (Date) [redacted] (Signature)

Dr. Katherine Moreau: June 11, 2018 (Date) [redacted] (Signature)

III. Conclusion to my MA Thesis by Article

In this final chapter, I discuss the wider implications of my study for the fields of health professions education and testing and measurement. I also discuss the lessons I gained by conducting this study. I conclude with a discussion of the next steps where I present some possible avenues for future research on the topic of accommodation.

Implications

The implications of my study extend well beyond the immediate context of licensure in the health professions. First, certification programs for other professions (e.g., law, accounting, engineering) also involve high-stakes examinations and are bound by the same legislated duty as health professions to accommodate individuals with disabilities. Improved accommodation practices developed for one profession can inform the practices of others. In addition, we can share these improvements with educators to inform the accommodation practices used in training, thus establishing realistic candidate expectations of licensing exams thereby enabling better exam preparation. This practice begins to close the gap between education and licensing and ensures fairness and consistency in assessments across the training trajectory. Similarly, the evidence-based accommodation practices developed for hands-on or performance-based exams may be useful to employers looking to improve accommodation policies in the workplace for professionals with disabilities after they obtain licensure.

Second, the way that professional bodies treat its potential members with disabilities at entry-to-practice sends a message to its wider membership about that organization's acceptance of diversity and its commitment to inclusivity. This has important ramifications for all members. Given that disability can affect any professional at any point in his or her career (due to aging, illness, or injury), professional associations and regulators should strive to create a culture that encourages disclosure of disabilities. Otherwise, professionals who fear discrimination may continue practicing without the necessary accommodations required to maintain patient safety. Furthermore, associations and regulators need to proactively consider their accommodation policies for continuing education and quality assurance programs to ensure that these activities are also accessible and capable of enabling fair assessment of professionals' competencies across the career span.

Lastly, this study contributes to an important discourse on the social acceptance of disability in professional roles. Creating more inclusive and accessible assessments in licensing

programs has implications for who we deem as suitable for entry into the health professions. In turn, this affects the eligibility requirements of health education programs. Ultimately, by increasing awareness of the accommodation needs of those with disabilities, this study also supports government initiatives meant to reduce barriers to the regulated professions and foster greater accessibility and inclusivity for those with disabilities.

Lessons Learned

In addition to the tremendous content knowledge that I have gained by completing this study, I have also learned many valuable lessons related to the general processes of conducting research. Furthermore, in taking on the role of principal investigator for the first time, I have gained valuable insights into my personal limitations and strengths as a researcher.

My first lesson came with the realization that research is sometimes a messy endeavour. Despite having a well-detailed plan and a prescribed method to follow, I found myself making numerous, unanticipated decisions throughout the various stages of the project. For example, creating boundaries around the type of literature that I included in my scoping review was challenging. The more focused searches I conducted yielded very specific literature, but not enough to warrant further study. The broader searches captured hundreds of articles involving accommodations in multiple settings, but were too vast to manage in one master's level thesis. Striking a balance with the search strategy and inclusion/exclusion criteria to yield a relevant but feasible amount of data was a difficult task.

Another lesson involved my approach to data management and analysis. I chose to conduct the thematic analysis of my 15 articles by hand. In retrospect, the use of qualitative analysis software, such as NVivo, for this step of the study would have made the task more feasible. While the number of articles I was analyzing was not too burdensome, I found that as the data I was extracting for the thematic analysis grew, it became increasingly difficult to manage and manipulate by hand. The main reason that I did not adopt the software at the onset of the study was that I was already contending with learning several software programs for other steps of the study, including Covidence, EndNote, SPSS, and Qualtrics. In hindsight, the thematic analysis proved to be the most time-consuming aspect of my study and the use of qualitative analysis software would have greatly improved the efficiency of this step.

Several lessons were associated with designing and conducting my stakeholder survey. For example, there was a seemingly endless number of important questions that I could ask my

participants. I could have designed a questionnaire to determine the types and frequencies of accommodations requested versus those granted, or I could have inquired about my stakeholders' accommodation policies, decision-making processes, or accommodation-based complaints. While these ideas were appealing, they were beyond the purview of my underlying research questions and study aims. Conducting a survey also taught me to lower my expectations of others' interests in my study. While my response rate was within the normal response parameters according to the survey literature, it fell short of my overoptimistic expectations.

My final and greatest lesson gleaned through this process was learning not to let my desire for perfection stand in my way of getting the study finished. After deciding with my supervisor that my thesis would be completed in article format, I became even more critical of my work. The fear of potentially releasing my study to a larger, unknown audience slowed down my writing and productivity considerably. On top of this, as many graduate students will relate, creating the time and mental space to write while juggling the demands of a day job and a family life is no small feat. Because of these challenges, learning to move forward and finishing this project has had a tremendous impact on my personal and professional growth.

Next Steps

This scoping review sets the stage for several avenues of future research. First, Canadian stakeholders expressed in Phase Two a need for improved understanding of antidiscrimination legislation, including the legal definitions of disability and reasonable accommodations under the law. A review of the Canadian-based case law, for example, could provide further insight into the contentious areas that warrant exploration. Second, engaging stakeholders, such as testing agencies, to co-produce research with researchers in this field supports stakeholder buy-in and improves access to historical exam data not publically available. Studies that describe current accommodation practices would also improve transparency and support consistency between stakeholders within and across professions. Transparency and consistency are foundational to the principle of fairness in testing. Third, in Phase Two, Canadian stakeholders also expressed a desire for research that establishes best practices for implementing accommodations, particularly regarding the assignment of extended time accommodations. Lastly, I recommend developing studies that engage health professionals with disabilities, either as co-investigators or as study participants. Doing so introduces a missing perspective into the scholarly literature and gives voice to the needs of those individuals who lie at the heart of accommodation use.