The Limits of Monetised Utility: Evidence from Indigenous Students' Postsecondary Education Decisions in Canada

by

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A PhD Thesis

Submitted in Fulfilment of the Requirements for the Degree of

Doctor of Philosophy in Finance

Adam Smith Business School

College of Social Sciences

University of Glasgow

May 25, 2026

ABSTRACT

This research combines principles from Psychology and Economics to gain insight into the present state of Indigenous engagement in postsecondary education in Canada and deepen our understanding of factors that may be contributing to educational disparities. In a series of papers, I explore the factors influencing the decisions of Inuit, Métis, and First Nations students to attend university, contributing to a more nuanced understanding of the motivations behind their choices. In doing so, I identify systemic empirical inconsistencies in leading economic theories and present evidence challenging the foundational assumptions upon which these theories are anchored and which have become the cornerstone of economic thought—that estimates of the monetary equivalent of the value of outcomes are reliable proxies for the utility those outcomes provide in non-money-maximizing entities. These findings suggest caution when treating monetised utility values as universal bases for comparison amongst individuals or subpopulations with varied backgrounds, histories, and cultures or when considering the adoption of theories which depend on financial incentives as the primary motivator driving student decisions to pursue postsecondary programs.

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ACKNOWLEDGEMENTS

My ultimate gratitude goes to my thesis supervisors, Dmitri Vinogradov and Robbie Paton, for their guidance, and for giving me the freedom to follow my heart. Their support throughout my career as a doctoral student kept me focused and motivated through good times and bad. Thank you for all the late-night Zoom chats and for all that it took to push me past the finish line.

I would also like to thank Daphne Taras who gave me this incredible opportunity when everywhere I turned doors closed. She provided me an opportunity to realize my full potential as an educator, researcher and champion for Indigenous initiatives at Toronto Metropolitan University.

To Steve Gedeon, Sean Wise, Jeff Overall and everyone who fought to give me the opportunity to learn and grow and whose acts of generosity helped shape the trajectory of my life and career. I don't know where I'd be today without their trust and support.

I would also like to thank Cynthia Holmes, Carrie Wiebe, Kim Bates, Ken Grant, Kelly McHale, Wendy Cukier, Andre Laplume, and everyone in the Entrepreneurship and Strategy department who helped me grow both personally and professionally. I'm grateful to have the opportunity to work with and learn from them.

I am also deeply indebted to Kelly Lendsay, Craig Hall, Faith Julien, Cordelia Sheppard and everyone at Luminary for their support and dedication to this work; Stan Cudek who is a constant source of inspiration and continues to break down barriers to education; Joanne Dallaire and Monica McKay for their love, wisdom and generosity; the Indigenous Business PhD student group for all the motivation; Sana Mulji, Cody Anthony, Maria Lypyavka, Ewan Cassidy (R.I.P.), and everyone who supported the TRSM Indigenous Initiatives team over the years. Along my journey, I was honoured to learn from and work with John MacRitchie, Marsha Mceachrane-Mikhail, Cory Searcy, Curtis Maloley, Sarena Johnson, Toni De Mello, Amy Desjarlais, and so many more. I am a better person having known each of them.

Lastly, I am forever grateful to my family who helped me find and stay on the right path. All my accomplishments are a tribute to them.

AUTHOR'S DECLARATION

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

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Signature:

ABBREVIATIONS

APS	Aboriginal Peoples Survey
CV	Coefficient of Variation
GoC	Government of Canada
HCT	Human Capital Theory
INAC	Indigenous and Northern Affairs Canada
NOC	National Occupational Classification
PSE	Postsecondary Education
PUMF	Public Use Microdata File
RCAP	Royal Commission on Aboriginal Peoples
RCT	Rational Choice Theory
rrr	relative risk ratio
RSS	Residential School System
SDT	Self-Determination Theory
ST	Signalling Theory
TRC	The Truth and Reconciliation Commission of Canada
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UT	Utility Theory

1 INTRODUCTION

"Education got us into this mess and Education will get us out of it"

– Justice Murray Sinclair (1951-2024)

1.1 SOCIAL SIGNIFICANCE

By almost every measurable indicator of wellness in society, Indigenous peoples in Canada are among, if not the most disadvantaged populations across North America. When compared to the non-Indigenous population, they face a 1.5 times higher unemployment rate (Bleakney et al., 2020), six times higher homicide rate (Department of Justice, 2019), more than two times higher infant mortality rate (Sheppard et al., 2017), eight times higher incarceration rate (GoC, 2018), three times higher drop-out rate (Dharia, 2013), lower life expectancy (Tjepkema et al., 2019), two to nine times higher suicide rate (Kumar & Tjepkema, 2019) and Indigenous children are 2.6 times more likely to end up in foster care (OHRC, 2018). According to the International Development Research Centre, Canada ranks seventh amongst 180 countries along five dimensions that reflect the citizens' quality of life (Prescott-Allen, 2001). The same country index applied to First Nations would rank them 63rd, alongside developing nations (Carr-Stewart et al., 2013).

The social and economic challenges faced by Indigenous peoples in Canada are well known and education may have an important role to play in overcoming them (Preston, 2008). Higher levels of education have been found to be associated with better health (Sloane-Seale et al., 2004), fewer arrests, incarcerations and reported crime (Lochner & Moretti, 2004), higher income (Pendakur & Pendakur, 2011) and lower unemployment (Berger et al., 2009). Indigenous peoples represent 4.9% of the total population and 7.7% of the child population making them the fastest growing population in Canada and actions need to be taken so that these youth can inherit a brighter future (Indigenous Services Canada, 2020).

1.2 THESIS GOALS

Currently, there are gaps in our understanding of how decisions to pursue postsecondary education (henceforth PSE) are formed and the non-financial factors that influence these decisions. This is evidenced in the growing education gap between Indigenous and non-Indigenous people in Canada (henceforth the education gap) that many leading theories are unable to account for. PSE is an inherent and a treaty right for Indigenous peoples in Canada (Carr-Stewart, 2001), yet they have among the lowest levels of education (Gordon & White, 2014). These educational disparities have been widening for decades despite concerted

efforts to provide equitable access to education and billions invested in Indigenous-specific initiatives promising to close the gap. Among them are additional funding for PSE, particularly Métis and Inuit students, mandatory cultural sensitivity training programs, curriculum changes in postsecondary institutions, and a variety of symbolic and structural changes (Solomon & Usher, 2025). Despite these efforts the education gap continues to widen at an unprecedented rate and across all levels of PSE. Recent reports show that this widening is most pronounced in rates of university attainment which increased from 19% in 2019 to 26% in 2024 (Hand-Gregory, 2024; Melvin, 2023; Solomon & Usher, 2025; Universities Canada, 2024).

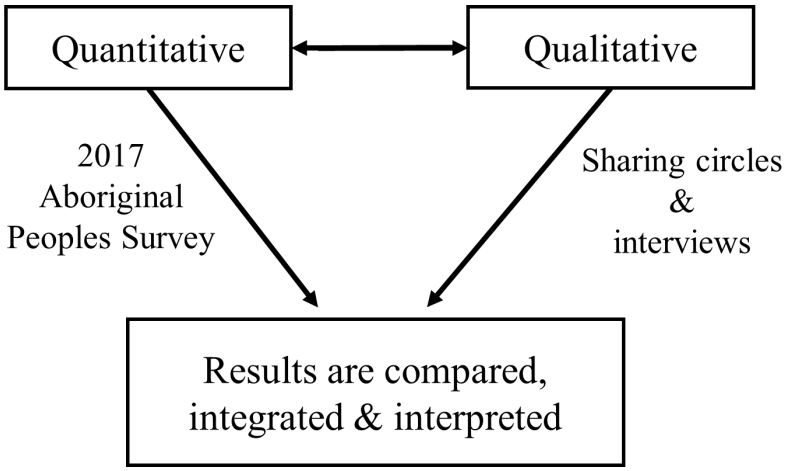
The findings presented in this thesis challenge popular economic theories that treat financial incentives as primary motivators driving student decisions to pursuing PSE. Instead, Indigenous students are found to be more driven to choose educational paths that align more closely with their culture and values, often at the expense of future earnings. Key factors influencing these decisions are identified, mapped on to a frame of reference and further investigated in a directed content analysis of the lived experiences of Indigenous university students (Hsieh & Shannon, 2005).

This research seeks to alert decision makers to the limits to economic rationality and monetised utility as a universal basis for comparing or evaluating actions, motivations, and decisions. The robustness of the monetary equivalents to approximate utility values in mainstream capitalist societies has led to misleading assumptions being applied to segments of the population whose motivations cannot be reduced to unidimensional measures. Through a more descriptive and empirically consistent understanding of students' decisions, we can better inform policies and allocate resources more effectively.

1.3 Thesis Structure and Methodological Approach

This thesis is composed of three studies structured as a concurrent mixed method design with Chapters 3 and 4 consisting of a quantitative analysis of the 2017 Aboriginal Peoples Survey and Chapter 5, a qualitative analysis of the lived experiences of university students in Canada (Creswell, 1999). Convergent and holistic triangulation are used to both assess the validity of popular theories in the labour economics literature and provide a more complete understanding of the issue (Turner et al., 2017). This approach starts broad with preliminary investigations informing subsequent investigations. As these studies take shape, the investigation becomes increasingly more focused until a conclusion is reached. This approach provides the ability to leverage emerging themes in the qualitative study to inform the tests performed on the quantitative data. Similarly, quantitative results are used to guide interviews and produce matching criteria for sample selection. This is an iterative and incremental approach which helps to ensure the alignment of all studies and that sufficient data is collected to produce meaningful results.

Figure 1.1: Concurrent triangulation mixed method design diagram.



Source: Constructed by author.

Chapter 2 provides readers with background information on the impacts of colonialism and how relationships between Indigenous peoples and education in present-day Canada evolved since contact with European explorers. This is framed within the context of several factors contributing to the education gap including the residential school system which led to the mass alienation of Indigenous peoples from the education system. Lastly, it outlines the state of Indigenous engagement in PSE over time alongside efforts to close the education gap. Importantly, the result of a preliminary analysis presented in Sect. 2.2 exposes an inconsistency between rates of education and employment earnings. This inconsistency suggests that economic theories may fail to capture the decisions of Indigenous peoples to pursue PSE in Canada and establishes the basis for subsequent investigations presented in this thesis.

Chapter 3 considers the persistence of the education gap against theories that treat financial incentives as the primary driver of decisions to pursue PSE. The apparent inconsistencies exposed in Sect. 2.2 are unpacked and investigated as a possible explanation for the education gap. More specifically, this chapter attempts to explain why the identity groups with the highest returns to PSE have disproportionately lower rates of education and why this trend is most prominent in qualifications that have the highest earnings premium.

Chapter 3 starts with a description of Rational Choice Theory, Utility Theory, Human Capital Theory and Signalling Theory alongside and in relation to the present state of Indigenous engagement in PSE in Canada. A four-stage hierarchical logistic regression is performed using the cornerstone determinants of employment income from each theory to test if educational disparities can be explained by differences in labour market outcomes. When applied to the Indigenous population, these factors are shown to produce similar estimates and follow a similar pattern to that of the general population. They are also found to be among the strongest predictors of employment income which strongly suggests that heterogeneity in the

determinants of labour market outcomes is not the cause of these educational disparities. In other words, the disproportionately low number of Indigenous university graduates is not because they provide Indigenous students with fewer financial incentives compared to other postsecondary credentials. These findings help to substantiate the preliminary findings presented in Sect. 2.2 and expose an empirical inconsistency between the observed levels of education and what these theories would predict based on observed postgraduation employment earnings. The inability of these theories to account for such pervasive and enduring discrepancies questions the validity of the foundational assumption upon which these theories are built—financial incentives are the primary motivators driving decisions to pursue postsecondary qualifications—and suggests that non-financial factors may play a more significant role.

Chapter 4 moves beyond transactional decision theories treating educational pursuits as financial investments by presenting a more holistic view of the decisions of Indigenous postsecondary graduates in Canada to complete a university degree over other postsecondary qualifications. This is approached by extending the analysis of the 2017 APS to include additional factors identified in the literature and limiting the scope of these tests to postsecondary graduates where the gap is most pronounced. Two hierarchical logistic regressions are used to explore the relationships between postgraduation earnings, several access and preference factors, and rates of university attainment amongst postsecondary graduates. The first regression (Model 2; Sect. 4.6.1) tests the cornerstone determinants of employment earnings from Model 1.4 and additional factors specific to postsecondary graduates against postgraduation employment earnings. The second (Model 3; Sect. 4.6.2) explores the relationships between the highest level of education and several factors affecting both access to and preferences in pursuing PSE. The results of these tests reveal a number of significant non-financial determinants which are then mapped onto a frame of reference consisting of four categories—barriers, enablers, motivators, and demotivators.

This study provides little evidence to support the proposition that Indigenous students pursue university degrees primarily for financial gain as proposed by leading economic theories. Instead, the results indicate that Indigenous students are more often self-directed and tend to pursue programs in better alignment with their cultures and values. They are also more likely to rely solely on funds from other parties to pay for their education, even though those who do are less likely to complete a university education and less likely to earn a higher postgraduation income than those who self-fund their PSE, either in whole or in part. These results also confirm the negative relationship between university education and residential school attendance among both survivors and their families; providing evidence of the intergenerational trauma experienced by the descendants of survivors. Lastly, these findings raise concerns over the government funding programs which may be amplifying and perpetuating the gap in university attainment rates by either incentivizing students to delay their studies or by restricting the options available to them.

Chapter 5 builds on the Model 3 results by developing a more nuanced and descriptive understanding of factors found to affect decisions to pursue university education amongst Indigenous postsecondary graduates. These factors include access to capital and sources of funding, reasons for program choice, guidance received, residential school attendance, and sense of belonging.

Together with an industry partner, I hosted a series of sharing circles and semi-structured interviews with Indigenous students across Canada. A directed content analysis of responses reveals several recurring themes and shared experiences which help to explain the significance of the factors of interest and grounds the quantitative results in a descriptive understanding of the lived experiences of Indigenous students pursuing university programs in Canada. These findings are then mapped onto the frame of reference presented in Sect. 4.3 to further contextualize findings and derive additional insights into the relative significance of factors affecting access to university education and those affecting students' preferences in pursuing them.

Findings indicate that the proximity of communities to universities, access to capital, underfunding of on-school reserves, and tracking to trade schools and colleges are ongoing interrelated issues preventing access to university education. Costs are most often described as those incurred by loved ones or disconnection from culture and benefits often take the form of helping others or flourishing. The distribution of references across factors indicates an overwhelming emphasis on non-financial influencers. This is especially pronounced in the effects of the residential school system which seemed to permeate all aspects of participants' lives. The incompatibility of worldviews emerged as a core mechanism shaping Indigenous experiences of belonging in university environments. Students often perceive universities as unsafe, unwelcoming, untrustworthy, inauthentic and exclusionary. Perceptions of university reinforced by experiences of racism are amplified by intergenerational trauma and often manifest as internalized inferiority and negative self-perception.

Positive factors driving student decisions and success in university centre around a strong sense of duty to better their community. These often relate to cultural advocacy, community building, cultural resurgence, language revitalization or paving a path for others by dismantling systems of exclusion. Indigenous-specific support systems are a source of strength and power frequently cited as giving meaning to their studies and providing the tools to heal and maintain balance. Indigenous spaces facilitate community building and belonging on campus, reconnection to culture and identity, and are most often where students experience affirmation and validation. Lastly, Indigenous role models and mentors, as well as non-Indigenous allies are found to be instrumental in ensuring Indigenous student success.

2 INDIGENOUS ENGAGEMENT IN EDUCATION IN CANADA

2.1 INTRODUCTION

2.1.1 Treaty Rights to Education

Throughout the 19th and early 20th century, treaty commissioners increasingly required more land to meet the needs of the expanding population of European settlers. Indigenous Nations and leaders, on the other hand, saw the emergence of unfamiliar colonial systems and negotiated treaties to ensure their survival and ability to participate and prosper in the new world on their own terms (Carr-Stewart, 2001). Many of these treaties included clauses granting members of treaty Nations the right to education in perpetuity. These treaties require the Government of Canada (GoC) to provide educational services to all First Nations Peoples regardless of age or sex for "as long as the sun shines above and the water flows in the ocean" (Asch, 1997). Many also acknowledged differences in ways of knowing, learning and teaching which is reflected in language granting these Nations control over their education (Fallon & Paquette, 2012).

Historically, PSE funding was provided to First Nations students individually by colonial governments. Following the Canadian Confederation in 1867, the GoC assumed the responsibility of fulfilling treaty obligations and promises made by the Crown. However, instead of honouring these agreements, they instead chose to provide educational services in accordance with their own legislation and used it to eradicate Indigenous culture and assimilate Indigenous peoples into Euro-Canadian society (Carr-Stewart, 2001). The weaponization of the education system against Indigenous cultures and identities has shaped Indigenous peoples' perception of the education system in Canada over generations and resulted in a deep-seated distrust of public institutions.

2.1.2 The Indian Act and Canada's Residential School System

The Indian Act was first passed on April 12, 1876 by the Parliament of Canada in accordance with the Constitution Act of 1867 (Indian Act, 1876). At its core, the Indian Act sought to legitimize the assimilation of Indigenous peoples into Euro-Canadian culture (Milloy, 2008). As such, many of the provisions would result in Indigenous peoples losing their status and legally alienate them from their Nations and cultures (Joseph, 2018). For example, if a community member were to obtain an education or serve an important role in Canada, they would be automatically disenfranchised. This meant that they were no longer recognized as Indigenous and forfeited all treaty rights to which they were entitled (Joseph, 2018).

One of the more devastating aspects of the Act and perhaps the most morally reprehensible use of a legal system to assimilate an Indigenous population is the Residential School System (RSS) (Brown, 1876). When attempts to eradicate Indigenous cultures through the adults failed, the GoC began to target the children—removing them from their families and communities and placing them in institutions where they were beaten and shamed into Euro-Canadian identities (Milloy & Mccallum, 2017). The purpose of the residential school system was to eradicate Indigenous language, culture, perspectives and knowledge systems. In his address to the House of Commons in 1883, Prime Minister Macdonald states,

> *"When the school is on the reserve the child lives with its parents, who are savages; he is surrounded by savages, and though he may learn to read and write his habits, and training and mode of thought are Indian. He is simply a savage who can read and write. It has been strongly pressed on myself, as the head of the Department, that Indian children should be withdrawn as much as possible from the parental influence, and the only way to do that would be to put them in central training industrial schools where they will acquire the habits and modes of thought of white men."*
> (TRC, 2015b)

The RSS saw over 150,000 Indigenous children over seven generations forced from their homes to live in residential schools where they were regularly abused—physically, sexually, psychologically, and spiritually. Ross (2009) gives a chilling glimpse into the experiences of these children who were taken as young as three and separated from their families for periods ranging from months to years (Ross, 2009). These children were not allowed to be Indigenous nor speak their language. They were routinely subjected to organized techniques of disempowerment and systematically belittled to feel ashamed of their Indigenous identities (Hearsum, 2010). These were places of hopelessness and abandonment that had enduring personal and intergenerational consequences (Ross, 2009).

> *"By far the most ambitious and tragic initiative, however, was the joint government and church residential school program. Introduced originally for [First Nations] children, the system would eventually draw children from almost every [First Nations, Métis, and Inuit] community across the country."*
> (*RCAP*, 1996b)

2.1.3 Intergenerational Trauma

In 2006, Barnes, Josefowitz and Cole conducted a retrospective analysis of the impact of residential schools on students' academic and cognitive development (Barnes et al., 2006). Several aspects of the RSS were analysed including curriculum, staffing, instruction time, and parental involvement; racism; language

prohibitions; and other forms of maltreatment. They found that the conditions of these schools would have resulted in diminished and underdeveloped cognitive abilities, low self-esteem and negative attitudes towards school and studying that would likely be transmitted to future generations. This is supported in a subsequent investigation which add the transmission of trauma responses, and psychosocial, developmental and neurobiological mechanisms to the intergenerational impacts of the RSS (Matheson et al., 2022).

> *"In 1943, R. Hoey, the department's superintendent of welfare and training, on receiving from the principal of St. George's School a set of shackles that had been used routinely "to chain runaways to the bed" and reports of other abuses at the school, wrote, "I can understand now why there appears to be such a widespread prejudice on the part of the [First Nations] against residential schools. Such memories do not fade out of the human consciousness very rapidly."*
> (*RCAP*, 1996b)

By separating these children from their communities and traditional knowledge systems, they effectively disrupted the intergenerational transmission of knowledge, worldviews and ways of being (Milloy & Mccallum, 2017). As Battiste and Henderson (2018) explain, the imposition of European knowledge systems on Indigenous peoples is an example of cognitive imperialism which subverts alternative ways of knowing and hinders the ability of these Nations to self-determine (M. A. Battiste & Henderson, 2018).

The scope of the devastation caused by the RSS has only started to surface in recent years. On May 28, 2021, media outlets started reporting shocking discoveries of unmarked graves found on the grounds of former residential schools across Canada. The first reported that 215 unmarked graves of children as young as three years old were discovered on the grounds of a residential school in Kamloops, B.C. (Dickson & Watson, 2021). Weeks later, 751 unmarked graves were discovered on the grounds of a residential school in Cowessess First Nation, Saskatchewan (BBC, 2021). As of October 2024, the National Centre for Truth and Reconciliation has documented over 4000 children who died at residential schools and estimates suggest there could be as many as 10,000 (Martens, 2024; TRC, 2015a).

2.1.4 The Royal Commission on Aboriginal Peoples

In 1996, the Royal Commission on Aboriginal Peoples released a public report detailing the current state of Indigenous engagement in the education system in Canada (*RCAP*, 1996b). This was the first widely publicized report to expose the magnitude of the education gap and one of the first connecting it to the RSS. This report identifies several factors amplifying and perpetuating the education gap including the distrust of public institutions and the education system. Many of the recommendations in the RCAP 1996 report

have been echoed in subsequent reports and just as the education gap continues to widen, many of the issues plaguing communities continue to worsen.

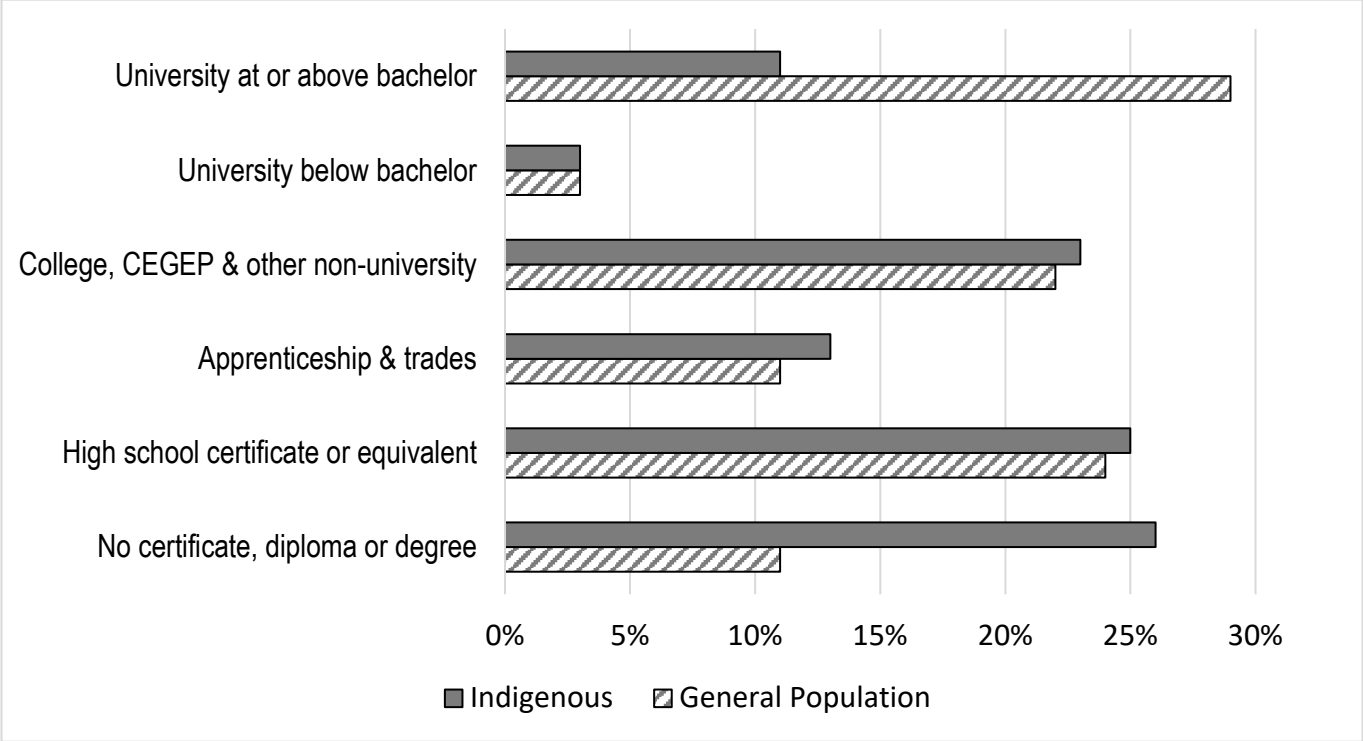
2.1.5 The Truth and Reconciliation Commission of Canada

The Truth and Reconciliation Commission of Canada was established June 1, 2008, with a clear mandate to preserve and expose the truth of Canada's RSS and its impact on students and their families (TRC Wiki, 2025). Under the leadership of the late Honourable Murray Sinclair, researchers considered testimony from 6,750 witnesses from over 300 communities, and millions of records (N.A., 2015). In 2015, they released a six-volume report comprising over 3,500 pages, two supplementary reports and 94 Calls to Action. They called on various governments, sectors and institutions to make changes in the way that they operate to be more inclusive of Indigenous peoples and address the ongoing impacts of the RSS (TRC, 2015c). Among them are nineteen calls which relate to education and training and seven that are specific to universities in Canada. Since its release, educational institutions have made significant changes, but those changes have had little-to-no effect on closing the education gap (Solomon & Usher, 2025). Several reports released by First Nations and Indigenous-led research institutions have been holding the government to account on living up to its promise to address the calls to action.

2.2 Educational Inequalities and the Education Gap in Canada

For decades, governments and educational institutions have witnessed a widening education gap between Indigenous and non-Indigenous peoples in Canada. Results from the 2016 Census show that 10% of the Indigenous population over 25 had some university education and that the education gap has widened from 15% in 2006 to 23% in 2016 (Statistics Canada, 2011, 2022). The 2011 National Household Survey shows a similar trend with 48.4% having a postsecondary qualification compared to 64.7% of the non-Indigenous population (Statistics Canada, 2018). Since as early as 1996, Indigenous students have consistently favoured college programs with the most recent data suggesting that almost half of all postsecondary graduates have completed a college diploma and nearly twice as many pursue college over trades certificates or university degrees (Gordon & White, 2014; Walters et al., 2004). Fig. 2.1 shows the educational attainment rates of Indigenous peoples next to that of the general population for different levels of education. The two most notable gaps occur at the high school level and the university level. According to the 2017 APS, 25.6% of Indigenous peoples in Canada have not graduated high school and the percentage of university graduates is just over one third that of the non-Indigenous population.

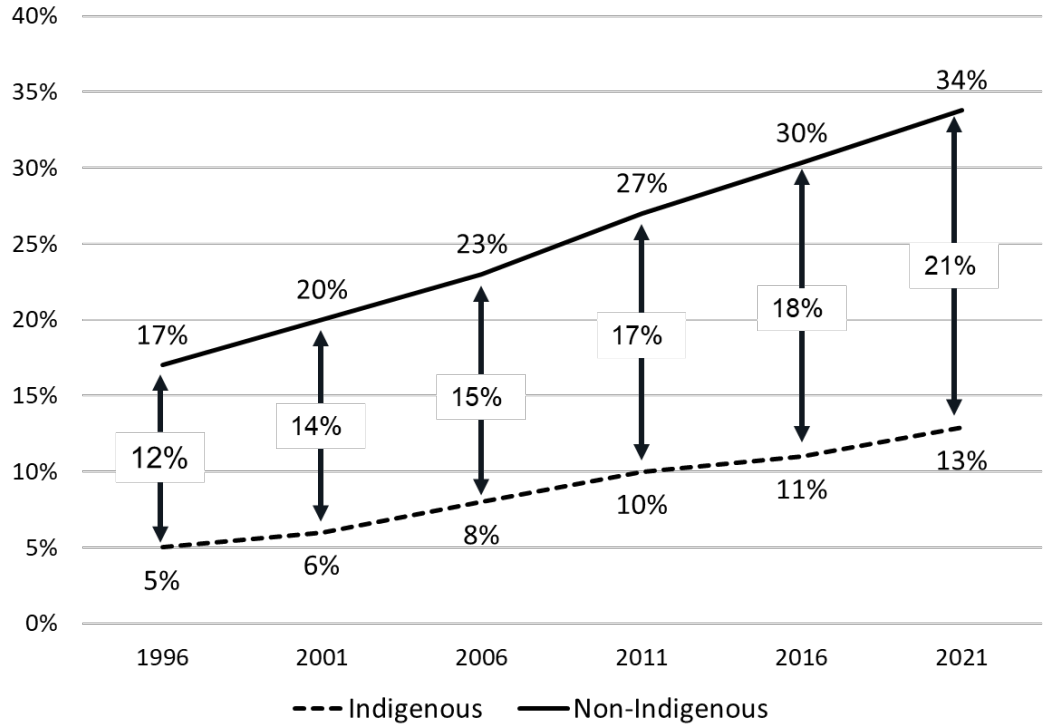
Figure 2.1: 2016 Rates of education in Canada by status (aged 25-64).



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

In 2011, 9.8% of the Indigenous population had obtained a university degree at or above the bachelor level compared to 26.5% of the non-Indigenous population (Statistics Canada, 2018). Respectively, these percentages increased to 10.9% and 29.3% in 2016 and to 12.9% and 33.8% in 2021 (Indigenous Services Canada, 2023; Statistics Canada, 2023b). Fig. 2.2 shows the gap in university attainment rates from 1996 to 2016 (Gordon & White, 2014). It illustrates not just the magnitude the gap, but that it has been continuously widening and has nearly doubled over the last two decades.

Figure 2.2: 1996-2021 University attainment rates by status (aged 25-64).



Source: Statistics Canada, NHS and census reports, with additional data from (Gordon & White, 2014)

One report released on the 10-year anniversary of the TRC's final report discusses measures taken to implement the TRC's Calls to Action (Solomon & Usher, 2025). Among them are additional funding for PSE, particularly Métis and Inuit students, the implementation of mandatory training programs, curriculum changes in postsecondary institutions, and a number of symbolic and structural changes. Despite international attention and nationwide changes, these efforts are doing little to improve labour market outcomes, nor are they closing the education gap. In fact, the gap continues to widen at an unprecedented rate and across all levels of PSE with the gap in university attainment increasing to a record high of 26% in 2024 from 19% in 2019 (Hand-Gregory, 2024; Melvin, 2023; Solomon & Usher, 2025; Universities Canada, 2024).

2.2.1 The Indigenous Population

According to the 2021 Census, there are an estimated 1.8 million Indigenous people in Canada. This includes roughly 625,000 Métis, 70,000 Inuit and more than a million First Nations peoples (Statistics Canada, 2021). The Indigenous population in Canada is one of the youngest and fastest growing demographics and now accounts for 5% of the total population. It grew at almost double the rate of the non-Indigenous population from 2016-2022 with some estimates suggesting that it could reach 3.2 million by 2041 (Statistics Canada, 2021). The Indigenous population is also on average 8.2 years younger than the non-Indigenous population, almost 17% of which are between 15 and 24 and nearly two-thirds of which are working age (Anderson, 2021; Statistics Canada, 2022).

2.2.2 Educational Attainment and Identity Groups

The GoC recognizes Indigenous Peoples in Canada as belonging to broad identity groups: Inuit, Métis and First Nations—with First Nations further divided into Status and Non-Status. Within these broad identity groups there are hundreds of Nations, communities, and cultural groups, with their own histories, beliefs, and traditions. For example, there are more than 630 First Nation communities representing more than 50 Nations and languages. In addition to First Nations, there are Métis, Inuit, and urban Indigenous communities in all parts of Canada. Rates of educational attainment vary widely amongst groups. Table 2.2 is a cross tabulation of education levels across the GoC's broad identity groups constructed from the 2017 APS. Each cell lists the weighted frequency expressed as an integer and percentage of the column total. Consistent with an earlier study, Status First Nations and Inuit are found to have substantially lower levels of education than Métis and Non-Status First Nations (Gordon & White, 2014). They show that the percentage of Status First Nations and Inuit whose highest level of education is below postsecondary are 58.0% & 68.3%, compared to 50.8% & 49.5% for Non-Status First Nations and Métis, respectively. Similarly, the percentage of Status First Nations and Inuit who have earned a postsecondary credential are 41.9% & 31.8%, compared to 49.2% & 50.6% for Non-Status First Nations and Métis, respectively.

Table 2.1: Educational attainment by identity group (aged 25-64).

	Status First Nations	Non-Status First Nations	Métis	Inuk (Inuit)	Multiple Indigenous identities	Total
Grade 8 or equivalent or lower	17,020 5.95%	6,690 4.40%	18,770 4.41%	5,900 14.97%	350 3.84%	48,730
Some secondary education	44,670 15.61%	17,820 11.73%	44,670 10.50%	9,750 24.75%	1,680 18.44%	118,590
Secondary school diploma or equivalent	48,740 17.04%	23,920 15.74%	70,180 16.49%	6,090 15.46%	1,040 11.42%	149,970
Some PSE	55,780 19.50%	28,750 18.92%	76,810 18.05%	5,150 13.07%	1,160 12.73%	167,650
PSE below bachelor level	92,660 32.39%	54,130 35.62%	161,740 38.00%	10,610 26.93%	3,840 42.15%	322,980
Bachelor's degree	19,170 6.70%	14,520 9.56%	40,540 9.53%	1,450 3.68%	490 5.38%	76,170
University above bachelor level	8,070 2.82%	6,120 4.03%	12,870 3.02%	450 1.14%	550 6.04%	28,060
Total	286,110	151,950	425,580	39,400	9,110	912,150

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

2.2.3 Educational Disparities in Other Colonized Countries

> *It is estimated that there are more than 370 million Indigenous people spread across 70 countries worldwide. Practicing unique traditions, they retain social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they live. Spread across the world from the Arctic to the South Pacific, they are the descendants - according to a common definition - of those who inhabited a country or a geographical region at the time when people of different cultures or ethnic origins arrived. The new arrivals later became dominant through conquest, occupation, settlement or other means.*
> (Secretariat, 2006).

The educational experiences of Indigenous peoples in other colonial countries are similar to those in Canada. In Australia, Moodie et al. (2018) conducted a review of 15 research papers from 2000-2016, most of which focused on barriers to Indigenous participation and retention in graduate education programs (Moodie et al., 2018). The find that the most common barriers are similar to those reported by undergraduate students in Canada. These include culturally inappropriate support or supervision, lack of social and academic support systems, financial challenges, isolation, cultural distance from Eurocentric education systems, and experiences of racism.

While globalization has brought about the dilution of local cultures and homogenization of lifestyles, it has also facilitated a growing solidarity amongst Indigenous peoples and allies around the world (Ipsos., 2023). In 2012, four women from Saskatchewan launched the “Idle No More” movement in response to the GoC's repressive and extractive laws. What began as a local demonstration quickly expanded into a global movement which ignited solidarity protests in dozens of countries across every major continent.

3 RETURN ON EDUCATION, RATIONALITY AND THE EDUCATION GAP

3.1 INTRODUCTION

The goal of this chapter is to gain insight into these educational disparities by deepening our understanding of the relationship between employment income, level of education, and discipline for Indigenous peoples in Canada. More specifically, it explores why the groups with the highest returns to PSE have disproportionately lower rates of educational attainment (i.e., Status First Nations and Inuit) and why this trend is most prominent in qualifications that have the highest earnings premium (i.e., degrees at or above the bachelor level). These observations suggest that existing theories based on postgraduate earnings might not capture the decisions of Indigenous peoples to pursue PSE in Canada.

This study considers the labour market outcomes for Indigenous students with varying education levels against economic theories, namely Rational Choice Theory (RCT), Utility Theory (UT), Human Capital Theory (HCT), and Signalling Theory (ST). It consists of a quantitative analysis of the 2017 Aboriginal Peoples Survey (2017 APS) to gain a deeper insight into the relationships between postgraduation employment income and levels of education in different occupations. The nature of this relationship is investigated by testing the reliability of financial incentives as primary drivers of decisions to pursue PSE. A hierarchical logistic regression is used to determine the effects education level alongside several other demographic and socioeconomic factors on employment income. All variables are grouped according to relevant theories guiding this work and added to the model in blocks to show the robustness of these relationships as well as to offer theory-driven insights into postgraduation employment earnings (Sect. 3.6.3).

The results of these tests indicate that the cornerstone factors in leading economic theories are equally strong predictors of employment income for the Indigenous population in Canada and therefore do not provide an explanation for educational disparities in Canada. The inability of these theories to account for such a pervasive and enduring discrepancy questions the validity of their underlying assumptions—that financial incentives are primary motivators driving decisions to pursue PSE—and suggests that non-financial factors may play a more significant role.

3.2 RATIONALITY, UTILITY AND THE ECONOMIC APPROACH

While the benefits of PSE on employment earnings in Canada are well-established, the reason why is the subject of ongoing debate. The two main schools of thought in the labour economics literature are the

human capital approach and the credentialist approach. The human capital approach assumes that education enhances the productive capacity of the individual which is then rewarded in the labour market through increased wages. The credentialist approach, on the other hand, treats education as a screening tool to identify candidates with qualities and abilities that will lead to greater productivity and reliability. Despite fundamental differences in the mechanisms through which PSE leads to increases in employment earnings, both theories assume that these financial rewards are the primary driver of decisions to pursue PSE. These and many other theories have evolved while remaining firmly anchored in RCT and UT as foundational principles and the universality of monetised outcomes as reliable proxies for utility (Tan, 2014).

RCT is a normative theory which tells us how to achieve our objectives given a set of constraints as opposed to a descriptive theory which describes the reality of how individuals achieve those objectives or a positivist theory which tells us what those objectives ought to be (Tan, 2014). It also, however, serves as a logical structure grounded in a set of principles or axioms that determine the rationality of behaviours (Oppenheimer, 2008). It is largely because of this logical structure that many now consider it a universalist theory of human behaviour (Green & Shapiro, 1994).

The logic of rationality as the basis for actions and behaviours has philosophical roots dating back to the 15th and 16th century with the works of Hobbes and Machiavelli (Neal, 1988), though it wasn't popularized until it was reconstituted in the 19th century as economic rationality by David Ricardo and Adam Smith in their efforts to replace mercantilism with capitalism (A. Smith, 1937; Zouboulakis, 2014). Both scholars leveraged the concept of rational actors acting in their own self-interests to the collective benefit of society through what Smith described as the invisible hand. Since then, RCT has permeated a variety of academic disciplines from sociology (Hechter & Kanazawa, 1997) to medicine (Li et al., 2024) and health (Bryan, 2018). In the economics literature, contributions such as Jevon's maximization principle and Pareto's instrumental rationality helped to refine the concept of rational choice preferences into a broadly applicable and testable theory.

Many scholars have also proposed imposing constraints on human rationality. Smith argued for morally constrained rationality based on a natural human inclination towards mutual sympathy. He argues that mutual sympathy imposes limits on individual pursuits of wealth accumulation in civilized societies where economic agents are also concerned with the fortune of others (A. Smith, 1776). Herbert Simon proposed that human rationality was bounded by cognitive limitations and proposed that people instead exhibited satisficing behaviour (H. Simon, 1983; H. A. Simon, 1956).

The axiomatic foundation as conditions for human rationality has faced criticism on the basis of the limits of human cognition. Humans were not believed capable of consciously rationalizing decisions by adhering

to complex mathematical axioms, though some argued that they wouldn't need to. One counterargument is the billiard player analogy made famous by Friedman and Savage in 1948. They argue that professional billiard players are capable of consistent performance in a game that can only be fully understood using sophisticated models from physics, geometry and mathematics (Friedman & Savage, 1948). Importantly, this analogy also supports the proposition that humans have an innate ability to maximize their self-interests through instinct and intuition independently of conscious thought.

3.2.1 The Existence and Nature of Utility

Most theories of action, motivation or decision accommodate individual differences through utility functions which allow for the non-linear treatment of outcomes. Lacking a universal understanding of the nature of utility (Jevons, 1888), a central issue in the evolution of argumentation in this field has centred on the epistemology of utility. From the late nineteenth century until the mid-twentieth century there was an extensive debate between the measurability and scale of utility that resulted in a clear divide amongst practitioners. Two distinct schools of thought emerged, one that believed in the cardinal interpretation of utility and the other that believed in ordinal utilities. As described by Moscati (2013), the debate between cardinal and ordinal utilities is slightly more complicated. He shows that early marginalists were not proposing cardinal utilities, but rather a different scale altogether and that cardinal utilities only came about during the ordinal revolution (Moscati, 2013). The shift in the interpretation of utility should therefore not be seen as a move from cardinal to ordinal and back again, but rather a drastic shift from a well-defined concept of utility relying on ratio scales to an ill-defined concept relying on ordinal scales and settling on a less demanding interpretation using interval scales. The concept and nature of utility is still being debated and has resulted in a variety of perspectives. Despite the progression in cardinal interpretations, many theories still use ordinal scales and even more have circumvented scales altogether by developing non-parametric methods.

3.2.1.1 Hedonic Utility and Pleasure-Seeking

One famous application of utility theory was proposed by Jeremy Bentham who believed in the interpersonal comparability of utility values and that the goal of social action should be to provide the greatest pleasure or happiness for the greatest number of people. Bentham believed that humans held a natural tendency to serve their own self-interests and proposed that the morality of decisions should be based on the amount of pleasure or pain they produced. He also devised an algorithm referred to as the hedonistic calculus to calculate the net pleasure induced by actions and therefore a means to maximize pleasure or happiness and minimize pain or suffering (Bentham, 1787/2007).

Bentham's definition of utility was largely contested on the basis that it characterized people as immoral pleasure seekers and that the hedonistic calculus could readily be used to justify socially unacceptable and morally reprehensible actions (Brandt, 1984). A notable example of this has been termed utilitarian genocide by Dadrian who cited early European colonial expansions into the Americas as a prime example (Dadrian, 1975). Bentham was also notably critical of Smith's theory of moral sentiments claiming that all systems of moral philosophy based on sympathy were flawed (Brady, 2020). Despite its limitations and ethical concerns, Bentham's earlier work would eventually lead to the development of egalitarian utilitarianism often considered the normative standard in ethical frameworks.

Among those who criticised Bentham's work was Smith who is largely considered to be a natural law theorist and wrote extensively about justice. Though an adamant anti-utilitarianist, his writings allude to a concept of utility based on instrumental utility or usefulness, aesthetic pleasure, or moral enhancement (Rosen, 2000; Witztum & Young, 2013). Notably, Smith rejected the idea that utility is something that can or should be measured and maximized, or that it should be the basis for decisions, justice, or virtuousness (Raphael, 1972). He also didn't consider utility to be an end in itself, nor the sole means to an end, and usually only obtained in retrospect (Winfrey, 1993). In this sense, Smith's views on utility and theory of action are much better aligned with Aristotle's virtue ethics and eudaimonic utility.

3.2.1.2 Eudaimonic Utility and Flourishing

Efforts to articulate utility began largely throughout the Middle Ages and into the 1700s, but the concept dates back much further. In fact, it was only relatively recently that definitions of utility were narrowed to concepts such as pleasure, happiness, satisfaction or expected value and something to be quantified or maximized. Historically, attempts towards universal definitions were often based on morality, virtuousness, purpose, or flourishing. Its nature was also most often described as non-material, relational, socially constructed, intrinsically motivated and transcending self-interests.

Among the earliest recorded conceptions of utility and human rationality is Aristotle's eudaimonia circa. 4th century BCE (Heinaman, 1993). Eudaimonia is best characterized as a unified way of life encompassing a multitude of dimensions such as belonging, justice, and social harmony (Fowers, 2016). In English, eudaimonia is loosely translated to mean happiness, though Greek or Aristotelian meaning is the highest good that a human can achieve through action. Eudaimonia is described as final or ultimate and a naturally occurring by-product of living a virtuous life. In fact, the only way to achieve eudaimonia is by living a virtuous life, but only if done authentically and not as a means to achieve eudaimonia. This is aptly referred to as Aristotle's happiness paradox (Bruni, 2010).

Religious doctrines often describe concepts similar to eudaimonic utility which vary largely by religion as well as the means through which they are achieved. Similar concepts can also be found in the works of psychologists since the late 19th century. For example, Maslow's theory of motivation describes the concept of self-actualization as a lifelong journey through several stages of fulfilling a series of categories of deficient needs before eventually transcending self-interests and self-actualizing through the fulfilment of being needs (Maslow, 2015). It claims that actions are motivated by a series of needs which cease to motivate once fulfilled or satiated. Though Maslow's process of needs fulfilment, it follows that the nature of utility would change throughout life stages. Maslow's process of self-actualization shares several similarities with developmental theories in psychology and religion as well as with Aristotle's concept of flourishing or eudaimonia (D'Souza & Gurin, 2016). Earlier stages where deficit needs are met might be most accurately characterised as hedonic or utilitarian, though self-actualization is innately eudaimonic (Greene & Burke, 2007). While Maslow does not presume or present any moral obligations, self-actualizing is described as a calling which transcends self-interests, and the highest need one could satisfy (Greene & Burke, 2007). Lastly, utility from an Anishinaabe perspective would likely share similarities with the Aristotelian eudaimonia considered highest achievable good through action but achieved only by living a virtuous life (Kotalik & Martin, 2016). Mino-bimaadiziwin—living in a good way—is based on a relational ontology and actualized by living the Seven Grandfather Teachings. It is normative, action-based, continuous and considered the highest state of being that humans can consciously attain.

3.2.1.3 Economic Rationality and Monetised Utility

Financial incentives are powerful motivators influencing the decisions and behaviours of individuals, businesses and governments. Their usefulness as a universal basis for comparison has made them invaluable in modelling human behaviours around the world—so much so that they have become the cornerstone of economic thought and led to theories anchored in universality of financial motivators as foundational principles (Gillig, 2017). One notable example of this is HCT as explained by Becker in his seminal work on the theory.

> *"[…] the economic approach provides a valuable unified framework for understanding all human behaviour. […] Only after long reflection on this work and the rapidly growing body of related work by others did I conclude that the economic approach was applicable to all human behaviour"*
> (Becker, 1976).

Modern expressions of the universality of economic rationality date back to the advent of expected value by Blaise Pascal and Pierre de Fermat in the mid-1600s (Szpiro, 2020). At the time, the purpose was to establish a set of objective and normatively acceptable rules that everyone could follow to calculate the

value of a gamble and that could be used in deliberations. Bernoulli later rejected the idea that rational decisions be made in strict accordance with early formulations of expected value and suggested that wealth should affect the sensibility of risky decisions. He introduced the concept of the utility of wealth which was presented as a non-linear transformation to potential outcomes based on the diminishing marginal utility of wealth. He proposed that utility of outcomes be universally defined as continuous, non-decreasing in wealth, and calculated as the sum of the economic value of one's possessions and future earning potential. In the absence of rare or unusual circumstances, Bernoulli believed that his theory of utility should apply universally and suggested a logarithmic function to represent individual utility based on the absolute diminishing marginal utility of wealth and the logic that no rational person will ever enter into a gamble where the disutility of losing is greater than the utility of winning (Bernoulli, 1954). Bernoulli's theory is the first published account of Expected Utility Theory; however, it is noted that renowned mathematician Gabriel Cramer presented a similar theory in 1728. Both scholars present the notion of a diminishing marginal utility of money and propose similarly shaped utility functions (Szpiro, 2020).

The connection between rationality, utility and financial incentives or the monetization of outcomes emerged as a universal standard after currencies stabilized in the late 19th century and neoclassical economics took centre stage in the mid-20th century. Economic measures were increasingly treated as universally acceptable representations value and utility-maximizing behaviour was increasingly operationalized as money-maximizing. It then naturally followed that financial incentives would emerge as primary motivators in economic theories of action, motivation and decision (Gillig, 2017). The idea of economic rationality was further developed and endorsed by Jevons and others throughout the marginalist revolution. Jevons, however, made a stronger claim asserting that all constrained human actions in all fields of human activity can be understood through the maximization principle. Jevons, Bernoulli, along with von Neumann and Morgenstern and many others all supported the existence of a universal utility function that transforms the value of outcomes according to wealth (Bernoulli, 1954; Jevons, 1888; von Neumann & Morgenstern, 1944).

John Stuart Mill also proposed a principle of economic behaviour wherein economic agents universally desired as much wealth and as little sacrifice as possible suggesting that they are motivated only in accumulating and consuming wealth (Mill, 1974). With that said, his views on the universality of desire for wealth were largely restricted to "economic agents" and his position softened over time (Gillig, 2017). Notably, Mill did not believe in the universality of principles of behaviour nor in the existence of a universal human character. In fact, he warned his fellow economists not to extend these assumptions beyond the limits of industrial societies—namely the United Kingdom and the United States (Zouboulakis, 2014).

Much of the debate around theories of motivation, action, and decision centre around money or wealth. In mainstream societies, money is a measure of value, a store of value, and a medium of exchange, while wealth most often refers to an abundance or large amount of material possessions (BOC, 2026; "Wealth," 2026). In the early 1700s, Bernoulli described wealth as the sum of the economic value of one's possessions and future earning potential. Much of the early literature in microeconomic theory and decision sciences describe it similarly as the economic value of property and the present value of future income (Markowitz, 1952). Concepts of wealth, however, vary widely across different cultures and through time. For example, Carol-Anne Hilton describes wealth from an Indigenous worldview as measured in the quality of one's relationships with others and with all of creation. Like money, these relationships acted as a store of value that one could invest in by giving in times of abundance and which were repaid with interest when they found themselves in need. These gifts were not given with expectations, but rather the act itself was its own reward (Hilton, 2021). Gift giving was considered an interest-bearing investment and a central feature of Indigenous economies (Loo, 1992). According to Dara Kelly, wealth in the Coast Salish economy is a function of continuity, resilience and survival, and reflected in the number of children and grandchildren in the community.

3.3 Earnings, Education and Human Capital

The concept of human capital has been used for over three centuries to estimate the economic impact of war and human migration (Hull, 1899), investments in health (Dublin & Lotka, 1930) and education (Becker, 1962, 1964), and compensation for loss of life (Wittstein, 1867), among others. Currently, the Organisation for Economic Co-operation and Development (OECD) broadly defines human capital as "the stock of knowledge, skills and other personal characteristics embodied in people that helps them to be productive" (Botev et al., 2019). It represents the productive capacity of individuals that can be sold on the labour market or otherwise used to create value and improve wellbeing (OECD, 1998, 2001). They are considered assets because there is a cost to acquire them and developing them increases earnings potential (Boarini et al., 2012). The idea to treat them as capital, however, can be traced back to Sir William Petty in 1691 in his attempts to produce estimates of national wealth which included the unrealized economic value of its citizens (Kiker, 1966). Petty believed that labour was the father of all wealth and should be included when calculating a nation's wealth. He later used this idea to demonstrate the economic impacts of war, deaths, and migration as well as to demonstrate the power of the English empire (Hull, 1899).

In 1776, the founding father of capitalism, Adam Smith, described the concept of human capital as "the acquired and useful abilities of all the inhabitants or members of the society" (A. Smith, 1937). Smith then goes on to explain the cost of acquiring these assets, "is a capital fixed and realised, as it were, in his person" (A. Smith, 1937). Many others contributed to the concept of human capital over the centuries, such as

Theodor Wittstein (1886) who used the concept as a basis for compensating loss of life, and Dublin and Lotka (1930) who used it to calculate life insurance policies, and the economic costs of disease and premature death (Dublin & Lotka, 1930; Kiker, 1966; Wittstein, 1867).

While human capital conceptually dates to the Middle Ages, the term didn't start appearing in the literature until it was popularized by American economists Gary Becker, Jacob Mincer, and Theodore Schultz from the late 1950s until the early 1970s (Becker, 1962, 1964; Mincer, 1958, 1974a; Schultz, 1961, 1970). One of the most notable contributions to this theory was presented by Gary Becker in his book, "Human Capital" published in 1964. This book would eventually win Becker the Nobel Prize in Economic Science in 1992. Since then, it has been used around the world to analyse an array of social and economic issues. For the purpose of this paper, the following is restricted to the theoretic underpinnings of HCT and its implication on decisions to pursue different levels of education.

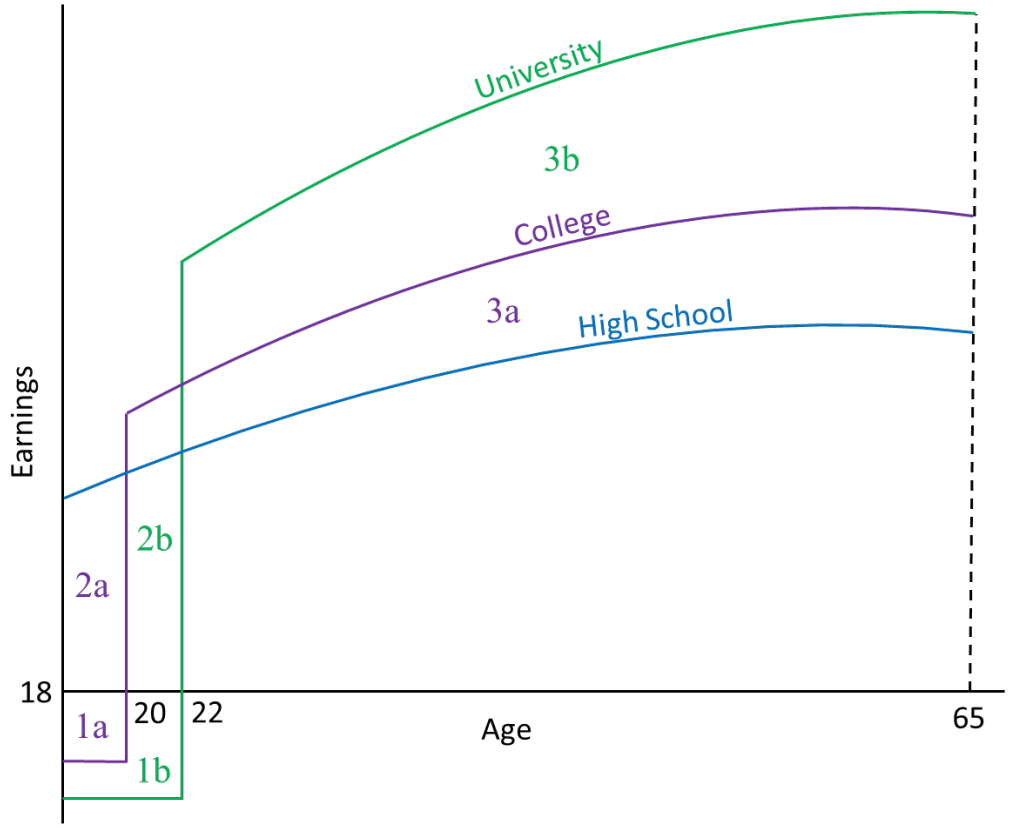
3.3.1 Human Capital Theory and Education

Historically, estimates of the monetary value of individuals were used to more accurately determine costs and assess risks, though it was also used it to promote investing in people as a way to increase a nation's productivity and wealth. Much of this work is centred around investments in education and suggests that the primary motivator for investing in education is to increase future earning potential. Human Capital Theory is derived from the neoclassical school of thought and grounded in the assumption that individuals are rational actors who optimise decision making to maximise their economic self-interests. HCT treats marketable skills like education as investments and assumes that people acquire skills and tools through their education that enhance their productivity in the workforce. This enhanced productivity is then rewarded by employers through an earnings premium. People then continue investing in education until the private costs of education are equal to the private benefits.

Fig. 3.1 depicts a hypothetical lifetime earnings path of people with different levels of education over time (excluding cost of living) with age on the x-axis and earnings on the y-axis (Patrinos & Psacharopoulos, 2020). Area 1a in this figure represents the direct costs of pursuing a two-year college program. Area 1b represents the direct costs of pursuing a four-year university program distributed even over time for the duration of the program. Similarly, area 2a represents the amount of income that could have been earned with a high school education while pursuing a college education and area 2b represents that which could have been earned with a college education while pursuing a university education. These are the upfront costs of obtaining a higher education, otherwise known as the opportunity costs. Areas 3a and 3b represent the increased earnings premiums that an individual would earn with a college or university education, respectively, over their working lives. If the present value of area 3a is larger than area 1a + 2a, then it is

profitable to pursue a college program. Similarly, if the present value of area 3b is greater than 1b + 2b (including areas 1a & 2a) then it is profitable to pursue a university degree.

Figure 3.1: Hypothetical age-earnings profile for different levels of education.



Source: Adapted from (Patrinos & Psacharopoulos, 2020) based on the work of (Mincer, 1974b)

Since most university degree programs are both longer and more expensive than most trades certificates and college diplomas, the direct and opportunity cost of pursuing a PSE is represented by areas 1 and 2 in Fig. 3.1 would be larger. Future earnings represented by area 3 would, however, also be larger and the difference in the present value of future earnings with a university degree greater than the present value of the difference in costs. This is especially true for Status First Nations students who have a treaty right to education and receive a disproportionately larger earnings premium for university degrees. If treated purely as an investment, then rational actors will choose the level of education that corresponds to the greatest (reward) Internal Rate of Return (IRR). As shown in Eq. 3.1, the IRR is a discount rate that makes the net present value (NPV) of all future cash flows equal to zero.

$$0 = NPV = \sum_{t=1}^{n} \frac{C_t}{(1 + IRR)^n} - C_0 \tag{3.1}$$

Where:

- C_t = Net cash flow at time t
- C_0 = Initial investment

- IRR = Internal Rate of Return
- n = The number of time periods

In other words, different levels of education vary in duration and direct costs and are associated with different levels of expected earnings. If all costs and earnings are discounted to the present time, the level of education with the highest discount factor needed to equalise costs and revenues would be the most profitable. This is further complicated by the fact that direct and opportunity costs are relatively certain, whereas future revenues are inherently uncertain. All else equal, this implies that individuals who are relatively more risk- or ambiguity-averse would be less likely to pursue higher levels of education. Eq. 3.2 denotes the private rate of return of education expressed as the NPV of education for a multiyear period. The left side of the equation represents the total costs of pursuing an education with C_t representing the direct costs and W_t representing the opportunity costs at time t for the duration of a program lasting s years. The right side of the equation represents the present value of the earnings premiums associated with that level of schooling $(W_t^s - W_t)$ from time $(s+1)$ until retirement at time n. The IRR (β) in this equation is also referred to as the private rate of return so that it is not confused with the social rate of return of education.

$$\sum_{t=1}^{s} \frac{C_t - W_t}{(1+\beta)^{t-1}} = \sum_{t=s+1}^{n} \frac{W_t^s - W_t}{(1+\beta)^{t-1}} \tag{3.2}$$

The average weighted cost of tuition for one academic year for bachelor's degree programs is $5,581 in 2012/2013, $5,772 in 2013/2014, $5,959 in 2014/2015, and $6,191 in 2015/2016 (Statistics Canada, 2012, 2013b, 2014, 2015). Assuming an additional $800 in ancillary fees and $1,300 for books and supplies, the cost of a four-year undergraduate program in Canada from 2012 until 2016 amounts to $32,000, while a two-year college diploma program would only cost $9,000 (Paying for College, 2022). Using data drawn from the 2017 APS and assuming constant median earnings for the duration of each age bracket, the average income is $27,500 for those without a high school diploma, $40,000 for high school graduates, $46,250 for college or trade school graduates, and $63,750 for university graduates. Assuming median employment earnings trajectories, the private rates of return on different levels of education for Indigenous peoples in Canada are expressed as a lifetime earnings trajectory in Fig. 3.5.

3.3.2 The Mincer Model

The Mincer equation is arguably the most widely used earnings function to estimate the returns to education in empirical studies. First developed by Jacob Mincer in 1974, it has become the cornerstone of a large body of literature in empirical economics and is widely regarded as the most precise method of modelling

the relationship between earnings, education, and work experience (Mincer, 1974a). It also allows for the analysis of factors that affect earnings independently from education. The Mincer equation is derived from Eq. 3.2 after making some generalising assumptions. If identical working lives of educated and uneducated people are assumed and the direct costs of education omitted, the private rate of return of education can be characterized as follows with the earnings profile of educated people on the right and uneducated people on the left. This can then be used to compare the earnings profiles of each and subsequently analysed using either a discrete- or continuous-time specifications as depicted in Eq. 3.3 and Eq. 3.4, respectively.

$$\sum_{t=1}^{n} \frac{W_t}{(1+\beta)^{t-1}} = \sum_{t=s+1}^{n+s} \frac{W_t^s - W_t}{(1+\beta)^{t-1}} \tag{3.3}$$

$$\int_0^n W(t) \cdot e^{-\beta t} dt = \int_s^{n+s} W^s(t) \cdot e^{-\beta t} dt \tag{3.4}$$

A further assumption of constant wages over the working life of two otherwise identical individuals simplifies the continuous-time private rate of return to education as shown in Eq. 3.5.

$$W = \frac{W_t^s}{(1+\beta)^s} \tag{3.5}$$

Rearranging the terms and taking the log of both sides produces the foundation of the Mincer equation in Eq. 3.6. The Mincer equation, as expressed in Eq. 3.7, includes terms for years of schooling (s) and years of work experience ($X + X^2$), which Mincer found to be a quadratic function of earnings (Mincer, 1958). For more information on the relationship between the private rate of return to education and the Mincer equation, readers are referred to (Checchi, 2008).

$$ln(W^s) = \ln(W) + s \cdot \ln(1+\beta) \cong \ln(W) + s \cdot \beta \tag{3.6}$$

$$ln(W^s) = \ln(W) + s \cdot \beta + X + X^2 + \varepsilon \tag{3.7}$$

Where:

- (W^s) = Earnings of an individual with s years of schooling,
- (W) = Earnings of someone with no schooling or experience,
- s = Number of years of schooling,
- X = Years of experience, and
- ε = error.

The Mincer equation shows the relationship between the log of earnings, level of education and work experience. This is an elegant solution to estimate the return to education that has been used on thousands of data sets across multiple countries and time periods (Lemieux, 2006). In his seminal work, Mincer found that the earnings profile is steeper for more educated people and concave with age (Mincer, 1958). An important implication of this is that earnings profiles differ between age groups leaving a single rate of return for education which is linear to log earnings. Subsequent studies have disputed this assumption and found that the relationship between earnings and education is non-linear in nature (Heckman et al., 2003).

The Mincer model is cemented as an integral component of the human capital framework and continues to inform research on educational decision making and labour market dynamics. It is one of the most widely used models in empirical economics to predict labour market outcomes, though it depends on several assumptions, many of which are not generally accepted. For example, it assumes that abilities and opportunities are identical for everyone, the returns to experience are the same for all levels of education, that education is exogenous and that within group returns to education are homogenous, linearity of log earnings to years of education, identical working lives regardless of their level of education, the economic environment is stationary, and that there is perfect information about labour markets outcomes (Card, 1999; Checchi, 2008; Griliches, 1977; Heckman et al., 2003). Mincer's model has also been shown to be biased and inconsistent due to omitted variables, measurement error, and heterogeneity of returns and costs of education resulting from differences in abilities (ability bias) and market imperfections (cost bias) (Card, 1995, 1999; Griliches, 1977).

3.3.3 Critiques of Human Capital Theory

The treatment of human beings as a form of capital has a long and controversial history due largely to its association with slavery and eugenics (Fix, 2021; Tan, 2014). Some also feel that reducing humans to rational utility-maximising actors is dehumanising, undermines freedom of choice, and renders them inherently more governable (Foucault, 1979; Hyslop-Margison & Sears, 2006; Read, 2009). The theoretical underpinnings of HCT have been the subject of great debate over the last half century with the advent of behavioural economics. Herbert Simon, among countless others have criticized rational choice theory as being overly simplistic and inconsistent with empirical evidence. Many also contest the claim that all education is attained for the purpose of future earning potential or to produce economic value and instead emphasise the role of non-financial motivations as primary drivers (Looker & Lowe, 2001; Senior & Whately, 1939; Verde, 2019). One of the first of these criticisms came from Nassau William Senior who wrote:

> *"Neither the labour which the boy undergoes, nor the expense borne by his father, is incurred principally in order to obtain future profit. The boy works under the stimulus of immediate punishment. It never occurs to the father that he is engaging in a speculation which is likely to be unprofitable. To witness a son's daily improvement is, with all well-disposed men [...] one of the sources of immediate gratification. The expense incurred for that purpose is as much repaid by immediate enjoyment as that which is incurred to obtain the most transitory pleasures. It is true that a further object may also be obtained but the immediate motive is ample."*
> (Senior & Whately, 1939)

It is worth noting that human capital economists do not disregard the non-financial benefits of education to individuals and society, though they are most often considered externalities. In fact Becker himself acknowledged that non-financial factors influence behaviour in his seminal work, but maintained that financial incentives were the primary driver (Becker, 1975). This was not only consistent with RCT but also offered a unifying approach to understand human behaviour and social issues.

Not all criticisms of HCT are theoretical or ideological in nature, several practical and empirical criticisms have also gained notoriety. For instance, the domination of economics over other disciplines in recent history has become the source of practical criticisms against HCT. Economics has influenced many disciplines in recent years including sociology, education, law, and political sciences—so much so that it has earned the title of economic imperialism, economic rationalism, and new managerialism (Tan, 2014). Some argue that this approach shifts valuable resources away from social welfare and towards production functions that place education as the source of economic development (Slaughter & Rhoades, 2004), while others argue that it acts to shift the financial burden of education away from governments onto the individual (Field, 2000).

3.3.4 The Credentialist Approach

The credentialist approach is perhaps the most influential concept rejecting the mechanism through which education increases employment earnings implied by HCT. The debate of social benefits to education largely centres around whether, and to what extent, education enhances the productive capacity of the individual. This led to the development of Signalling Theory (ST), coined by Spence (1973), which claims that education acts only as a screening tool to identify candidates with a greater ability to produce, both in their productivity and the reliability of their performance (Oreopoulos & Salvanes, 2011; Spence, 1973; Weiss, 1995).

The argument for education as a screening tool rests on the idea that companies hire employees based on imperfect information where only the candidate knows their ability and there is incentive for less talented individuals to exaggerate their abilities. Companies then screen applicants based on observable factors related to the candidate's ability that are too costly for lower ability individuals to imitate. This is structured as a sequential move or dynamic game of incomplete information. It is sequential in the sense that the potential employee first decides to pursue a level of education knowing that this will signal their ability to employers. Employers then use this information to inform their hiring decisions. It is characterized as an imperfect information game because only the potential employee knows their nature or ability and there is incentive for less talented candidates to trick potential employers by imitating more talented candidates. Education is often used as an observable factor that is widely regarded as being too costly for less talented individuals to imitate. The idea can be summarised in Eq. 3.8 which depicts the differences in costs of education for more and less talented individuals, A, the different wages that those individuals could attract in an open market, W, and two levels of schooling, S.

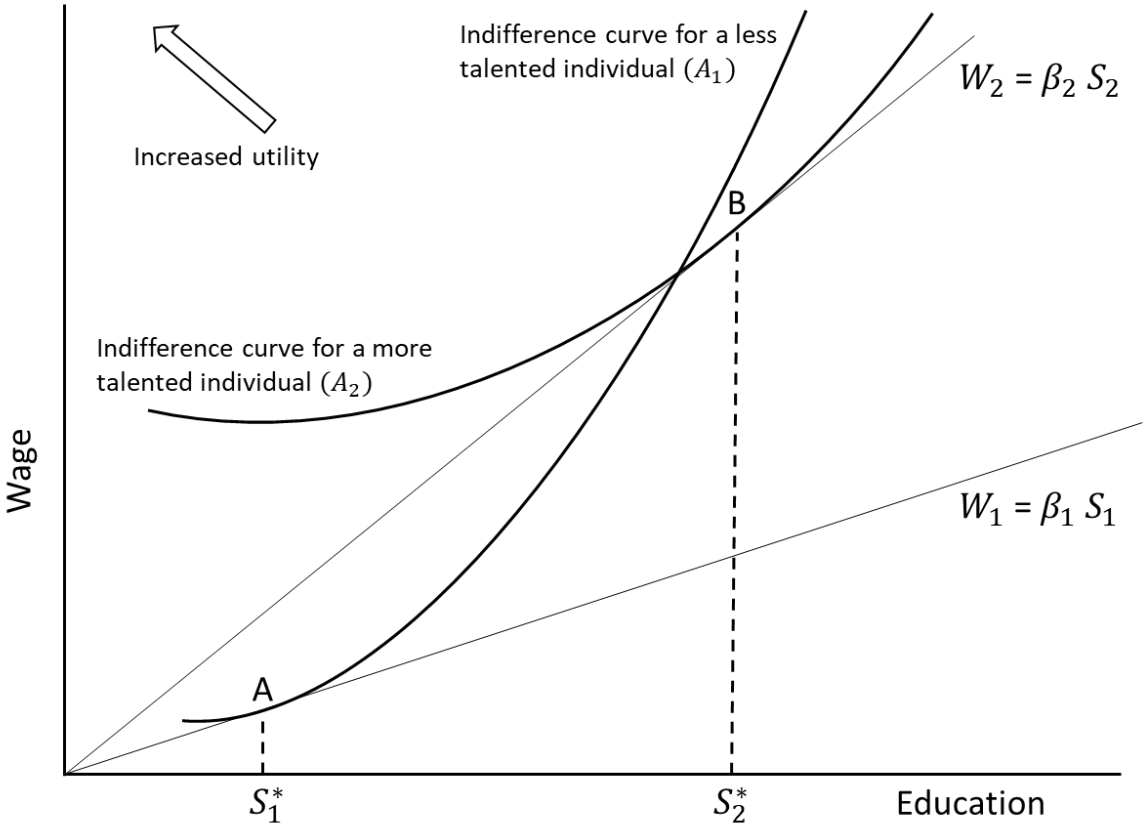
$$\gamma(S_2, A_1) - \gamma(S_1, A_1) \geq W_2 - W_1 > \gamma(S_2, A_2) - \gamma(S_1, A_2) \tag{3.8}$$

Where:

- A_1 & A_2 represent the abilities of lesser and better abled individuals, respectfully,
- W_1 & W_2 represent the fair market wages for lesser and better abled individuals,
- S_1 & S_2 represent a lower and greater level of education, and
- $\gamma(S, A)$ is the cost of education as a function of level of schooling and ability

It is assumed that $W_1 < W_2$ and that $\gamma(S_i, A_1) > \gamma(S_i, A_2)$, or rather that the cost of attaining a level of education (S_i) is greater for less talented people than it is for more talented people. If the right side of Eq. 3.8 doesn't hold then more talented employees will not find the income difference to be worth the additional effort to obtain more education. If the left side doesn't hold then less talented people will find it worthwhile to imitate more talented people. Fig. 3.2 depicts a separating equilibrium for two individuals with different abilities alongside two wage functions. This is a situation where wage rates are constructed so that the increased cost of obtaining higher wages are worthwhile for some and too costly for others. The indifference curve for the more talented individual, (A_2), is flatter than the less talented individual, (A_1), reflecting their decreased costs or effort to obtain higher levels of education. In this graph, less talented individuals will reach their optimal education level at S_1^*, and more talented people at S_2^*. In this scenario, neither individual has any incentive to pursue any level of education other than then the maximums depicted by points A and B. If the more talented individual obtains education S_1^* to earn the wage W_1, and if the less talented individual obtains education S_2^* for W_2, they would both find themselves on a lower indifference curve.

Figure 3.2: Equilibria levels of education for differently abled individuals.



Source: (Checchi, 2006). The economics of education: Human capital, family background, and inequality (Fig. 6.2, The signalling equilibrium, p. 180). Cambridge University Press.

The proposition that education does little, if anything, to enhance the productivity of individuals in the workplace is known as the strong signalling hypothesis, though there is little empirical evidence to support it (A. Clark, 2000; Jaeger & Page, 1996). It is, however, reasonable that employers would use education as an indication of an applicant's abilities regardless of the program's relevance to the position or productivity-enhancing effects. Weak signalling hypothesis suggests that education serves to both foster productivity as well as a signal of innate abilities (A. Clark, 2000; Liwiński & Pastore, 2021). There is a growing body of empirical evidence supporting it including the increase in alternative screening methods developed by companies and integrated into their hiring procedures. Alternative screening methods can come in the form of internships, background checks and a variety of pre-employment testing designed to measure the aptitudes of applicants. Many large firms in Canada engage in these practices, but employers who lack the means to independently assess each applicants' skills and abilities often rely on education as a sign of productivity.

3.4 Earnings and Education for Indigenous Peoples in Canada

3.4.1 Education Levels and Wage Gaps

The financial incentives to attaining a postsecondary qualification in Canada is evidenced in the strong positive relationship between the education and both employment earnings (Emery, 2004; Vaillancourt, F. & Bourdeau-Primeau. S., 2002) and the likelihood of securing employment (Berger et al., 2009; Walters et al., 2004; Zietsma, 2005). According to the 2006 Census, the unemployment rate of Indigenous peoples who haven't completed high school is 22.5%, more than double the national average of 11.1%. This rate decreases with the completion of a university degree to just 6.4% for Indigenous peoples and the employment gap decreases to less than 2 percent of the national average (4.5%) (Berger et al., 2009). Walters, White & Maxim (2004) obtained similar results using the 1995 National Graduates Survey after accounting for sociodemographic characteristics and education (Walters et al., 2004). The same study also found that Indigenous females' probability of being unemployed are twice as high as visible-minority females, and more than four times as high as non-minority female university graduates.

Two popular methods to measure the individual-level benefits of education are earnings premiums and rates of return. The earnings premiums are often calculated as the average difference amongst the median earnings of graduates with different postsecondary qualifications. The rate of return is expressed as the earnings premium divided by the direct and opportunity costs of completing a postsecondary program.

3.4.1.1 Earnings Premiums

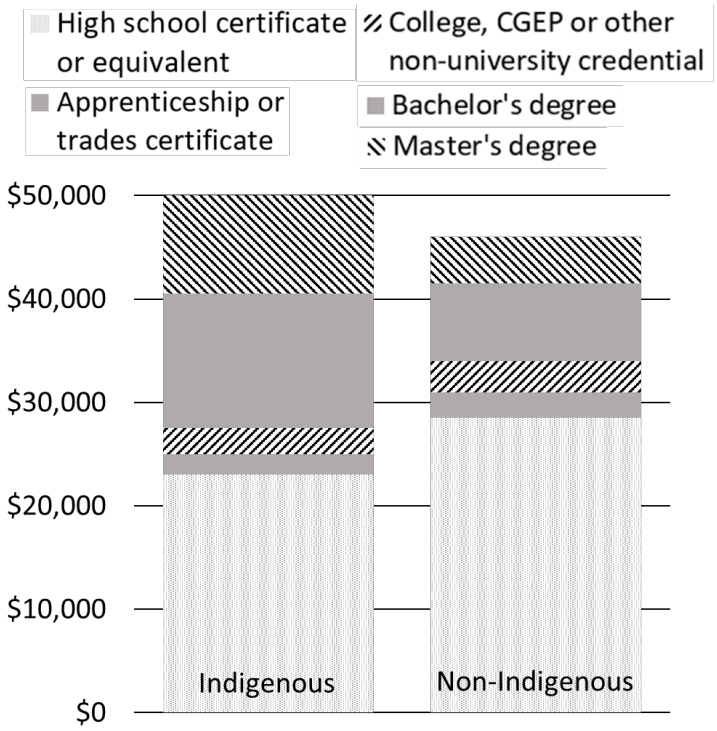
The earnings premiums for all classes of education have increased over the 20-year period with the most significant increases observed in trades education (Boothby & Drewes, 2006; Riddell, 1994). Boothby & Drewes (2006) use census data to examine the earnings premiums to university, college, and trades education from 1981-2001 in Canada. They find that, relative to a high school diploma, the premiums for those with university degrees are an order of magnitude higher than those with college diplomas and trade school certificates. In fact, the earnings premium for those with college diplomas are less than one-third of that enjoyed by university graduates. This earnings difference is even more pronounced amongst the Inuit population. The annual income difference between high school and university ($37,526) is more than double that of college ($16,303) (N.A., 2020).

The earnings premiums to education are well documented in Canada and observed in graduates of all backgrounds and cultures to varying degrees. There is, however, earnings gap which must be considered. The median income of Indigenous peoples ranges from approximately 70% to almost 95% of that of the

non-Indigenous population with the smallest gap occurring in those who have earned a bachelor's degree (Berger et al., 2009; Lamb et al., 2018; D. Wilson & Macdonald, 2010). One study even found that Indigenous university graduates earn substantially higher postgraduation incomes than both other-visible minorities and non-minority degree holders (Walters et al., 2004). According to census data, the income disparity at the bachelor level has decreased from $3,382 in 1996 to just $648 in 2006 (D. Wilson & Macdonald, 2010). Below the bachelor level, however, Indigenous peoples make consistently less than non-Indigenous people with the same level of education. The most significant disparity in returns to PSE occurs in trades certificates and college diplomas (Berger et al., 2009; Walters et al., 2004; D. Wilson & Macdonald, 2010). These qualifications are coincidentally those most often attained by Indigenous peoples (Gordon & White, 2014). Part of the reason why the earnings gap is so prominent in college and trades education may lie in the jobs secured postgraduation. Park (2021) conducted a study using the 2016 Census data to explore the mismatch between employment and education levels in Indigenous peoples (Park, 2021). The results of this study indicate that Indigenous university graduates are more likely to secure better-matched jobs and significantly less likely than college or trade school graduates to be overqualified.

Labour market outcomes are also trailing behind the non-Indigenous population with the majority of Indigenous peoples earning credentials that will earn them relatively little compared to university degrees. Fig. 3.3 shows the earnings premiums associated with different levels of education for Indigenous and non-Indigenous peoples in Canada (D. Wilson & Macdonald, 2010). The wage gap is large and significant amongst those who have completed high school and increases up to a university degree at or above the bachelor level. In other words, the premium in median income associated with both trade school certificates, and college diplomas are both less than their non-Indigenous counterparts. The premium associated with a bachelor's degree and master's degree, on the other hand, are both considerably larger for Indigenous peoples to the point that they negate or even reverse the wage gap. The same report also identified significant wage disparities between males and females, with Indigenous females earning substantially less than males of the same identity group and with similar levels of education.

Figure 3.3: Earnings premiums by education level and identity (aged 25-44).



Source: (D. Wilson & Macdonald, 2010). The Income Gap Between Aboriginal Peoples and the Rest of Canada (Table 10, Median Income by Age and Educational Attainment, p.18).

3.4.1.2 Rates of Return

The high college attainment relative to university degrees might suggest that Indigenous students are basing their PSE decisions on rates of returns rather than earnings premia. In 2002, Boothby & Rowe estimated rates of return using simulated lifetime earnings and found that the median return of a bachelor's degree was significantly lower than that of a college diploma. This is due to the lower direct costs of these programs and the shorter amount of time needed to obtain college diplomas. Their findings indicate that men receive 12 percent and 16 percent median rate of return for a bachelor's degree and college diploma, respectively, while women receive a 13 percent and 18 percent return. They also did not find that there were any significant increases in earnings premia for obtaining both a college diploma and a university degree beyond that produced by obtaining a bachelor's degree alone.

While the results presented by Boothby & Rowe (2002) account for unemployment and time out of the workforce, they represent national income levels and therefore do not account for income and earnings gaps (Lamb et al., 2018; D. Wilson & Macdonald, 2010). Indigenous college and trade school graduates typically earn less than both visible minorities and non-minorities with the same level of education (Walters et al., 2004). In 2011, Pendakur & Pendakur conducted an analysis of the earnings-education profiles of five groups of Indigenous peoples and their British-origin counterparts (Pendakur & Pendakur, 2011). They find that while earnings and income returns to education vary widely across groups of Indigenous peoples,

gender, geographic location and educational attainment, they are almost consistently lower for the five groups of Indigenous peoples when compared to their British-origin counterparts. They also find that among the five groups; Status First Nations are found to experience the most significant earnings disparity. This trend is most prominent in high school graduates, and the disparity decreases substantially amongst those who have completed a bachelor's degree. Some groups of Indigenous university graduates such as on-reserve Status First Nations and Métis women are even found to have a higher earnings return than British-origin university graduates (Pendakur & Pendakur, 2011).

These studies show that Indigenous peoples earn less than non-Indigenous people, that this disparity is most prominent in college and trade school graduates, and insignificant in university graduates. What is less clear is whether these relative disparities are large enough to reduce or even reverse the higher rates of return for college graduates detailed in Boothby & Rowe (2002). Given the relatively low earnings premium obtained by Indigenous college graduates and the magnitude of the university premium relative to non-Indigenous graduates, it is unlikely that this would account for educational disparities and the disproportionately high rates of college enrolment.

Lastly, when we consider educational disparities and returns to education amongst groups of Indigenous peoples, we find that Status First Nations and Inuit have consistently lower levels of education than Non-Status First Nations and Métis (Sect. 2.2). Importantly, up until 2017 when this data was released, Status First Nations and Inuit were also the only groups whose treaty rights to education were recognized and subsidized by the GoC. This decreased cost would also give these groups the highest returns to PSE, yet they have disproportionately lower rates of education. More specifically, these groups have consistently higher percentages in educational attainment below a postsecondary qualification and consistently lower percentages at or above a postsecondary qualification. This finding is consistent with data from the 2011 NHS that shows that the proportion of First Nations people with a postsecondary qualification was almost 10% lower among First Nations people with treaty rights to education than those without registered or treaty status (Statistics Canada, 2013a).

3.4.2 Education Levels and Labour Market Outcomes

The data used in this section was made available through the Research Data Centres Program which provides university researchers secure access to detailed microdata from national surveys through portals located on campus. Summary statistics are used to describe the geographic, demographic and socio-economic characteristics of Indigenous peoples engaged in postsecondary programs or who have attained a postsecondary diploma, certificate, or degree. This is accompanied by a series of cross tabulations

estimating the proportion of Indigenous peoples with different levels of education based on identity group, geographic region and major field of study or discipline.

All tables referred to in this section are listed in Appendix 1 and figures are weighted using person-level weights developed by Statistics Canada to mitigate any potential sampling error and ensure their alignment with census estimates (Vongdara et al., 2020). These weights allow for results to be generalised to all Indigenous peoples over 15 living in private dwellings excluding Nations and communities that were not surveyed. To protect the confidentiality of participants, the figures in the crosstabulations and summary tables are rounded to the nearest multiple of 10 and small weighted frequencies are merged with other groups (Vongdara et al., 2020).

According to the 2017 Aboriginal Peoples Survey, 104,609 Indigenous people across Canada some university education, 68,797 would have liked to pursue a university degree at or above the bachelor level in the past 5 years, and 118,021 are currently working in occupations usually requiring a university education. This data also shows that, 77% of those with a postsecondary credential chose colleges and trades schools over university. Indigenous postsecondary graduates tend to pursue higher levels of education in Humanities, Physical & Life Sciences & Technologies, and Education, and lower levels of education in "Architecture, Engineering, and related technologies" and "Personal, Protective and Transportation Services." The majority of those who have attained a postsecondary credential (21.7%), and those with a master's degree (24.3%) pursue Business, Management and Public Administration. The regional distribution of major fields of study and levels of education are roughly consistent across Canada with relatively fewer graduates in the prairie provinces and territories (1.5% compared to 2.8% in the rest of Canada), a higher percentage of doctorates in Ontario (0.46% compared to an average of 0.22% in the rest of Canada), fewer graduates in the territories and in Quebec pursuing health and related fields (9.9% & 8.3%, respectively, compared to an average of 15.4% in the rest of Canada), and a lack of graduate degree holders in Visual and Performing Arts, Communications Technologies, Mathematics, or computer and information sciences. Status First Nations and Inuit are also found to have consistently higher percentages in highest level of educational attainment below a postsecondary qualification and consistently lower percentages at or above a postsecondary qualification with the largest gaps occurring between Inuit and Métis.

Table A.1.1 is a crosstabulation of the highest levels of educational attainment and major field of study for Indigenous postsecondary graduates. According to the table, most of those with a bachelor's degree study Social and Behavioural Sciences or Law (23.6%); and most of those with a doctorate study Health and related fields (24.2%). This table also shows that the majority of postsecondary graduates (21.7%) and those with a master's degree (24.3%) studied Business, Management and Public Administration, but relatively

few go on to pursue a doctorate. In fact, 65.4% of all Indigenous doctorates hold degrees in Humanities, Social & Behavioural Sciences, Law, and Health & related fields leaving only 34.6% in all other disciplines. Noticeably, there are also a lack of PhD holders in Visual and Performing Arts, Communications Technologies, Mathematics, or computer and information sciences. Similarly, there are few in these disciplines with even a master's degree. This includes the technology sector which is one of the largest and fastest growing industries in Canada contributing over 57 billion dollars to the Canadian GDP in 2019 and employing 574,000 people in Canada (BDC, 2021). This sector has been growing twice as fast as the Canadian economy over the last decade. Table A.1.1 also indicates that the overwhelming majority (77.0%) of Indigenous students choose to study at either colleges or trades schools regardless of discipline. The only disciplines where students tend to pursue higher levels of education are Humanities, Physical & Life Sciences & Technologies, and Education. Similarly, students studying Architecture, Engineering and related technologies, and Personal, Protective and Transportation Services tend to pursue apprenticeships, trades certificates or college diplomas.

Table A.1.2 is a crosstabulation of province or territory of residence and major field of study for Indigenous postsecondary graduates. This table indicates that the regional distribution of major fields of study is roughly consistent across Canada with the exception of a greater percentage of graduates in the territories whose programs cannot be classified among the categories of fields of study (4.3% compared to an average of 0.6% in the rest of Canada). Additionally, only 9.9% and 8.3% of those who have completed a PSE in Quebec and the territories, respectively, pursued health and related fields, compared to an average of 15.4% in the rest of Canada. Similarly, Table A.1.3 looks at the distribution of education levels by province or territory of residence. This table indicates that the regional distribution of levels of educational attainment is roughly consistent across Canada with the exception of the territories which have consistently lower levels of education. Noticeably, there are relatively fewer graduate degree holders in the prairie provinces and territories (1.5% compared to 2.8% in the rest of Canada), and the percentage of those living in Ontario with a doctorate is over twice as high as the average in the rest of Canada (0.46% and 0.22%, respectively).

3.4.2.1 Education Levels and Earnings Profiles

Table 3.1 is a crosstabulation of employment earnings and level of education for Inuit, Métis, and First Nations peoples in Canada who are over 15, living off-reserve and earning employment income in 2016. The table lists the weighted frequencies rounded to the nearest multiple of five as well as the frequency as a percentage of the sum of each column. Conditional formatting has been applied to the columns to show the relative proportion of income brackets for six levels of education. According to this table, almost two thirds of those without a high school diploma and a little over half of those with either a high school diploma or some PSE, earn less than $30,000 a year. This accounts for 47% of all Indigenous peoples in Canada

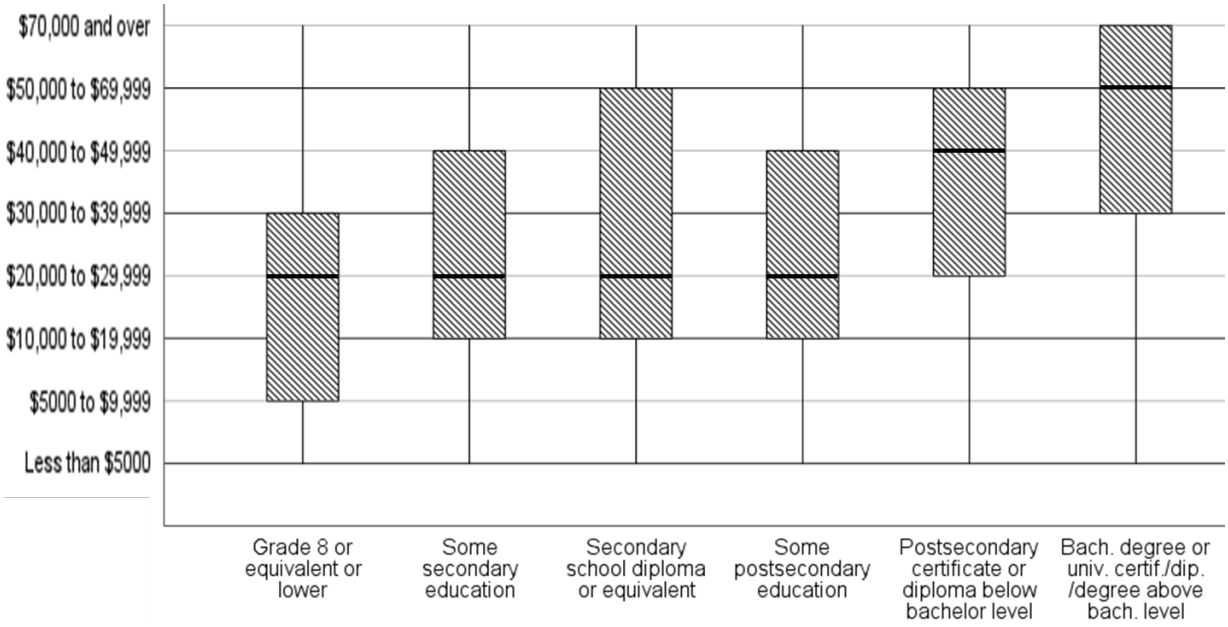
who were employed in 2016. As indicated in Fig. 3.4 and on Table 3.1 in grey, the median employment income for those without a PSE remains constant at $20,000 - $29,999 and increases sharply for postsecondary graduates. It increases by 80% from $20,000 - $29,999 to $40,000 - $49,999 for those who have obtained a postsecondary credential below the bachelor level and again by 33% from $40,000 - $49,999 to $50,000 - $69,999 for those who have earned a university degree at or above the bachelor level. For a more detailed cross tabulation of educational attainment and employment income, readers are referred to Table A.1.4.

Table 3.1: Highest level of education and employment income.

	Grade 8 or equivalent or lower	Some secondary education	Secondary school diploma	Some PSE	PSE below bachelor	Bachelor's degree or above	Total
Less than $5000	2,110	7,670	11,483	12,526	12,675	2,959	49,423
	17.1%	14.0%	11.7%	11.0%	5.6%	3.5%	8.4%
$5000 to $9,999	1,542	4,905	8,646	13,251	11,786	3,417	43,547
	12.5%	8.9%	8.8%	11.6%	5.2%	4.0%	7.4%
$10,000 to $19,999	2,136	9,831	14,734	22,191	24,501	5,569	78,962
	17.3%	17.9%	15.0%	19.5%	10.8%	6.6%	13.4%
$20,000 to $29,999	**2,017**	**10,088**	**15,000**	**15,024**	25,697	6,483	74,309
	16.4%	18.4%	15.3%	13.2%	11.4%	7.6%	12.6%
$30,000 to $39,999	1,522	6,951	12,377	12,193	29,969	6,469	69,481
	12.3%	12.7%	12.6%	10.7%	13.2%	7.6%	11.8%
$40,000 to $49,999	707	3,809	9,168	10,966	**28,167**	7,135	59,952
	5.7%	6.9%	9.3%	9.6%	12.4%	8.4%	10.2%
$50,000 to $69,999	1,145	6,208	13,946	12,568	39,604	**15,792**	89,263
	9.3%	11.3%	14.2%	11.0%	17.5%	18.6%	15.1%
$70,000 and over	1,153	5,447	12,998	15,067	53,907	36,944	125,516
	9.3%	9.9%	13.2%	13.2%	23.8%	43.6%	21.3%
Total	12,332	54,909	98,352	113,786	226,306	84,768	590,453
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

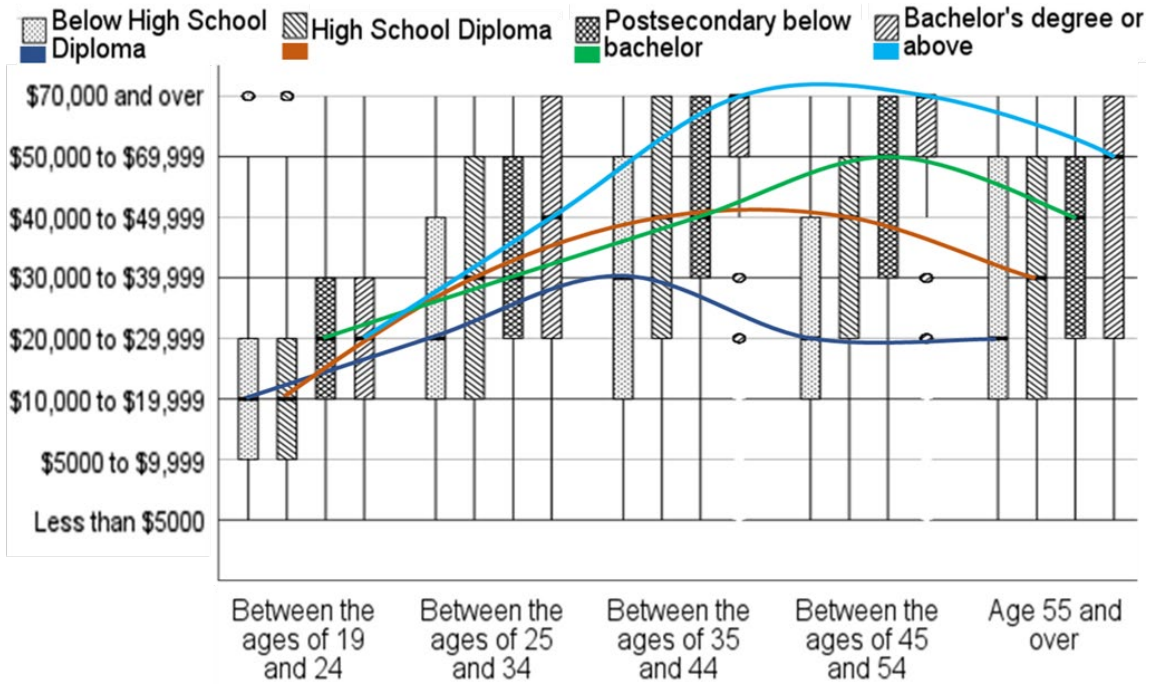
Figure 3.4: Simple boxplot of total employment income by education level.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Fig. 3.5 displays the trajectories of median employment income for Indigenous peoples over 18 in Canada by age bracket for different levels of education. For those with less than a high school diploma or equivalent, median income increases by less and peaks earlier than for all other education levels. For those with a high school diploma or some PSE, the trend is similar though it peaks higher and longer for those with some PSE. The group with the highest lifetime earnings trajectory and that most heavily skewed towards the higher income brackets are those with bachelor's degree or above.

Figure 3.5: Clustered boxplot of employment income by age and education level.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

3.5 Research Questions and Hypotheses

The following research questions seek to use existing theories to explain the education gap, establish a basis for comparison and benchmark results against empirical findings. This is approached by systematically testing the cornerstone determinants of employment income from well-established theories representing different schools of thought that are all anchored in RCT and UT as foundational principles and in the universality of monetised utility. Should these tests produce results that are not consistent with that of the general population, then it presents a possible explanation for the education gap. If, however, they produce similar results, and there are no other rational explanations which could account for the gap, then we must reject the assumption underlying these theories—financial incentives are driving decisions to pursue PSE.

Q.1: Can the education gap be explained through postgraduation earnings (ROI, Earnings Premia)?

a) Is postgraduate employment income related to discipline or occupation?
b) Is postgraduate employment income related to education level?

H.1: The education gap reflects differences in labour market outcomes for Indigenous peoples.

a) The education levels obtained most often will be those that result in a higher postgraduate employment income and these differences will be different from the general population.
b) The occupations chosen are those that provide a higher postgraduate employment income and these will be different from the general population.

Q.1.1-1.3: Do the cornerstone factors from the Mincer model and signalling theory have the same effect on employment earnings for Indigenous peoples as they do for the general population? Are there other determinants of employment earnings that affect Indigenous peoples differently?

H.1.1-1.3: The results will differ substantially from those of the general population thereby providing a rational explanation for the education gap.

Q.1.4: Do the results from Models 1.1-1.3 differ amongst Indigenous identity groups? Do the effects of the determinants of employment income vary by identity group?

H.1.4: The effects of these determinants vary amongst identity groups which help to explain educational disparities within the Indigenous population.

3.6 METHODOLOGY

3.6.1 The 2017 Aboriginal Peoples Survey

The 2017 APS is a national cross-sectional survey conducted every five years by Statistics Canada. This cycle of the survey was conducted over a seven-month period between January 16 and August 15, 2017. The purpose of the survey is to collect information on the social and economic conditions of Métis and Inuit and off-reserve First Nations Peoples aged 15 years or older. It provides information on postsecondary credentials and attendance at the graduate and postgraduate levels, in addition to information on income, major field of study, area of residence, community involvement, and several other factors shown to act as barriers, enablers, and motivators to pursuing PSE.

The survey takes approximately 40 minutes to complete and was administered using a Computer Assisted Telephone Interview and a Computer Assisted Personal Interview. Participants in the 2017 APS are drawn from the 2016 Census of Population long-form survey and selected using a multiple-phase stratified random sampling design based on geography, age, and identity group. The 2016 census collected data from 15.4 million dwellings in Canada with a response rate of 98.4%. A percentage of long-form questionnaire respondents were then selected for participation in the 2017 APS. The 2017 APS sample comprises 43,645 participants who reported an Aboriginal identity or ancestry on the 2016 Census of Population long-form survey. After excluding non-Indigenous respondents, the total number of respondents in the 2017 APS is 24,220 and the response rate was 76%.

Participants were selected based on predefined domains of estimation, or stratification-specific domains of estimation. These domains were created using crosstabulations of various combinations of geography, age and identity group (Vongdara et al. 2018, p. 18). Different groups of respondents are sampled separately according to a number of different strata and in order to match population group or strata estimates from the larger census survey. Consequently, participant selection was not random as you might find in a simple random sampling design and therefore the probability of a participant being selected varies across predefined strata. To account for this survey design, person-level weights and bootstrap weights are applied as described in Sect. 3.6. The total number of variables is 1067 including 259 derived variables. The total number of variables is 1067 including 259 derived variables (Statistics Canada, 2017).

The population of interest for this study is Indigenous peoples in Canada over 15 years of age living off-reserve and who are currently employed. This consists primarily of people who have attained postsecondary credentials and who reside in Canada's 10 provinces. Notably, First Nations living on-reserve and many of those living in the Yukon and the Northwest Territories are not reflected in this data.

3.6.2 Variables of Interest

The variables of interest in the following regressions include a combination of the dependent variable and eight additional variables which include four ordinal (age, tenure at current job, skill level, education level), two categorical (occupation, identity group), and two binary variables (sex, employment status).

The dependent variable, total 2016 employment income, is split into two categories according to the median employment income ($30,000) with zero equal to the bottom 50 percent of earners and one representing the top 50 percent. In addition to being the median income, an employment income of $30,000 is also significant with respect to level of education. As shown in Table 3.1, the $30,000-$39,999 income bracket acts as a clear differentiator between the higher incomes earned by postsecondary graduates and those whose highest level of education is below a postsecondary credential. Despite being the median income bracket for the entire population, it is not the median income for any specific level of education. In fact, the median employment income for Indigenous peoples who have not earned a postsecondary credential remains constant at $20,000 - $29,999 regardless of educational level. The median income then skips the $30,000-$39,999 bracket to $40,000 - $49,999 for those who have obtained a postsecondary credential below a bachelor level. Readers are referred to Sect. 3.4.1 for a more detailed explanation of the significance of $30,000.

Table 3.2: Summary statistics for employment income with weighted frequencies.

Total 2016 employment income - Groups							
Answer Categories	**Freq.**	**Weighted Frequency**	**%**	**Code**	**Freq.**	**Weighted Frequency**	**%**
Less than $5000	1,586	70,145	7	0	6,483	276,557	27.7
$5000 to $9,999	1,210	49,516	5				
$10,000 to $19,999	2,005	82,185	8.2				
$20,000 to $29,999	1,682	74,711	7.5				
$30,000 to $39,999	1,361	69,604	7	1	6,502	345,142	34.6
$40,000 to $49,999	1,142	60,090	6				
$50,000 to $69,999	1,675	89,457	9				
$70,000 and over	2,324	125,991	12.6				
Valid skip	6,352	299,008	29.9	.	7,864	376,818	37.7
Don't know	0	0	0				
Refusal	0	0	0				
Not stated	1,512	77,810	7.8				
Total	20,849	998,517	100		20,849	998,517	100

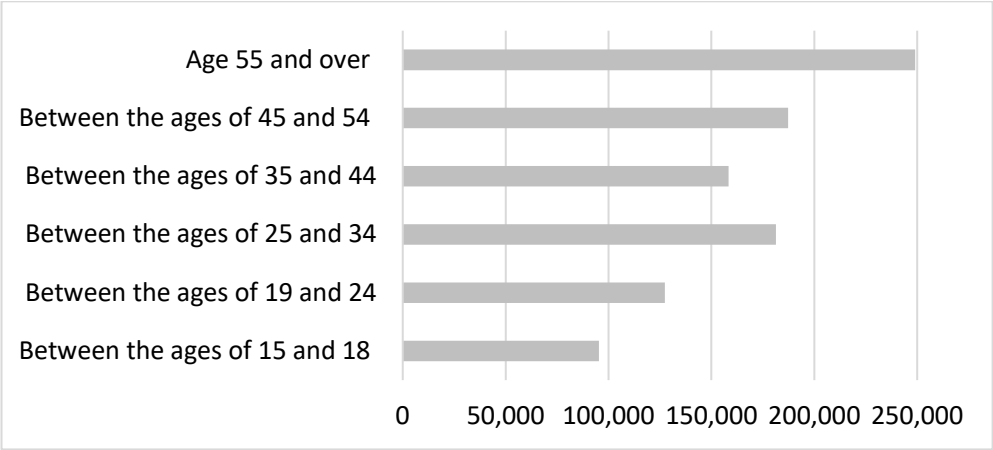
Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

The 2017 APS groups the highest level of educational attainment variable into six categories: "Grade 8 or equivalent or lower"; "Some secondary education"; "Secondary school diploma or equivalent"; "Some

postsecondary education"; "Postsecondary certificate or diploma below bachelor level"; and "Bachelor's degree or above."

Age is widely regarded as a strong determinant of employment earnings in large part due to its relationship to work experience and productive capacity (Sect. 3.2.4). It is one of the cornerstone factors in the Mincer model and regularly included in both models that predict income and in those that estimate the financial returns to education (Heckman et al., 2003; Lemieux, 2006; Mincer, 1958). Age is calculated according to the date that data collection began, January 15, 2017, and grouped into six brackets shown below. The majority of respondents are over 55 with progressively fewer respondents in each successive bracket.

Figure 3.6: Weighted frequency of respondents across age groups.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Age is often used to calculate years of work experience though studies have shown that earnings are not always consistent across age groups and often non-linear in nature (Heckman et al., 2003). Work experience and age are therefore treated as independent and distinct determinants of employment income. Work experience is determined by the variable "Tenure at current job or business" or rather the number of years they have maintained continuous employment with their current employer. Respondents are categorized as having been employed by their current employer for one year or less, between one and six years or more than six years. Employment status is controlled for by including a dummy variable separating respondents who are employed on a full- or part-time basis with full-time employment equal to zero. Similarly, sex is categorized as either male or female and structured as a dummy variable with female equal to one.

Respondents' current occupation is defined by the National Occupational Classification (NOC) 2016 system which categorizes occupations into 10 broad groups, 40 major groups, 140 minor groups, and 500 unit-level groups (Statistics Canada, 2016). This system is developed and maintained through a partnership between Statistics Canada and Employment and Social Development Canada. In the interest of consistency with baseline studies and the descriptive statistics presented in Sect. 3.4, occupations are classified

according to the ten broad groups. This variable is first recoded to ensure that the category with the most observations, “Trades, transport and equipment operators and related occupations,” is defined as the base outcome.

According to signalling theory described in Sect. 3.2, the occupational skill levels required for a position will be significant and positively related to income. This approach assumes that people are either more or less talented and education levels act only as a screening mechanism to differentiate between more and less talented individuals and is accounted for in the following regression. This variable also accounts for job mismatch in the labour market outcomes of college and university graduates (Park, 2021). Occupational skill levels are aggregated in the NOC 2016 system into four broad categories: “Skill level A - Occupations usually requiring university education”; “Skill level B - Occupations usually requiring college education or apprenticeship training”; “Skill level C - Occupations usually requiring secondary school and/or occupation-specific training”; “Skill level D - On-the-job training is usually provided for these occupations.” This variable is recoded in reverse order with on-the-job training used as the base outcome.

Indigenous identity groups are included in this model due to their relationship with educational attainment and employment earnings (Sect. 2.2) as well as its use as a strata or domain of estimation in the sampling design. The 2017 APS recognizes three single identity groups: “First Nations”; “Métis”; and “Inuk (Inuit).” They also include two additional categories, “Multiple Indigenous identities”; and “Indigenous responses not included elsewhere” which were merged into a single category since they are less meaningful and had relatively few observations. Lastly, all variables in the dataset include categories for “Don’t know”; “Refusal”; “Not stated”; and “Valid skip.” All four of these categories are treated as missing in the following analysis.

Table 3.3: Model 1 – Summary Statistics.

Variable	Categories	Weighted frequency	%
Employment income	Low income (<$30,000 CAD)	276,557	71.4
	High income (≥$30,000 CAD)	345,142	89.1
Highest level of educational attainment	Grade 8 or lower	48,529	5.8
	Some secondary education	118,918	14.2
	Secondary school diploma or equivalent	150,343	18.0
	Some postsecondary education	168,450	20.1
	Postsecondary certificate below bachelor level	323,807	38.5
	Bach. degree or above	104,609	12.5
Age group of respondent	Between the ages of 15 and 18	95,308	9.5
	Between the ages of 19 and 24	127,437	12.8
	Between the ages of 25 and 34	181,294	18.2
	Between the ages of 35 and 44	158,262	15.8

	Between the ages of 45 and 54	187,232	18.8
	Age 55 and over	248,984	24.9
Tenure at current job or business	Began working in 2016 or 2017	158,248	27.1
	Began working between 2011 and 2015	198,767	34.1
	Began working before 2011	226,145	38.8
Occupational skill levels (NOC 2016)	A - University education	118,021	20.2
	B - College education or apprenticeship training	233,151	39.9
	C - Secondary school and/or job-specific training	143,166	24.5
	D - On-the-job training is provided	89,392	15.4
Employment Status	Full-time	462,405	79.8
	Part-time	116,381	20.2
Sex	Male	467,880	46.9
	Female	530,637	53.1
Occupational category	Trades, transport and equipment operators and related	105,386	18.1
	Occupations in manufacturing and utilities	22,501	3.9
	Natural resources, agriculture and related production	18,388	3.1
	Sales and service occupations	165,763	28.4
	Occupations in art, culture, recreation and sport	16,601	2.9
	Occupations in education, law and	79,000	13.5
	Health occupations	34,626	6.0
	Natural and applied sciences and related occupations	22,345	3.8
	Business, finance, and administration occupations	81,687	14.0
	Management occupations	37,021	6.3
Identity Group	Single identity - First Nations	482,066	48.3
	Single identity - Métis	458,918	46.0
	Single identity - Inuk (Inuit)	44,032	4.4
	Multiple Aboriginal identities	9,529	1.0
	Responses not included elsewhere	3,972	0.4

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

3.6.3 Statistical Tests

Model 1 shown below and described in equations 3.9 to 3.12 is structured as a hierarchical logistic regression to gain insight into the nature of the relationships between employment earnings, level of education and seven additional determinants of employment income derived from theories and empirical studies. More specifically, it tests the effect of attained education level among several other factors on the likelihood that Indigenous peoples will earn a higher postgraduation employment income.

The following analysis is composed of four Logit models structured as a hierarchical regression as depicted in Eq. 3.9. Groups of variables are added in three successive blocks as shown in models 1.2-1.4 and detailed in Eq. 3.13-3.15. With the exception of Eq. 3.10, all equations show the expanded form used by Stata in the calculation. These equations, starting with Eq. 3.11 expand categorical variables into a series of binary

dummy variables with i representing the number of categories. Each categorical variable is then expanded into $i - 1$ dummy variables with one category serving as the base outcome.

$$logit[P(Y = 1|X_1, \dots, X_n)] = \ln\left(\frac{P(Y = 1)}{1 - P(Y = 1)}\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_n X_n + \varepsilon \tag{3.9}$$

Model 1.1 includes employment status as a control and the cornerstone factors from the Mincer model—education level, age, and job tenure. The Mincer model has been shown to be robust across a variety of contexts and environments and was developed as a way to analyse human capital investments. This model is the gold standard for estimating income as a function of education and work experience and serves as the foundation of this hierarchical regression. Should the results differ from the general population, then education, age and work experience are either not significant determinants of income for Indigenous peoples or produce asymmetric returns to education which could help to explain the education gap.

$$\ln\left(\frac{P(Y = 1)}{1 - P(Y = 1)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \tag{3.10}$$

$$\ln\left(\frac{P(Y = 1)}{1 - P(Y = 1)}\right) = \beta_0 + \sum_{j=1}^{5} \beta_{1j} D_{1j} + \sum_{k=1}^{4} \beta_{2k} D_{2k} + \sum_{l=1}^{2} \beta_{3l} D_{3l} + \beta_4 D_4 + \varepsilon \tag{3.11}$$

Model 1.2 adds a block of variables that are presumed significant according to signalling theory or the credentialist approach. These include the occupational category and skill level. Employment earnings are often tied to occupation which in turn is closely related to education level. A preliminary analysis presented in Sect. 3.4 revealed a significant discrepancy between employment earnings in different occupations as well as the proportion of Indigenous peoples working in different occupations.

$$\ln\left(\frac{P(Y = 1)}{1 - P(Y = 1)}\right) = \beta_0 + \sum_{i=1}^{4} \sum_{j=1}^{J_i - 1} \beta_{ij} D_{ij} + \sum_{k=1}^{9} \beta_{5k} D_{5k} + \sum_{l=1}^{3} \beta_{6l} D_{6l} + \varepsilon \tag{3.12}$$

Model 1.3 adds the sex of the respondent to test if there are gender differences in employment earnings. Sex is widely regarded as a significant factor in understanding wage disparities (Fortin, 2019). It has also been central to many of the criticisms of the Mincer model and HCT which earlier works omitted (Marginson, 2019).

$$\ln\left(\frac{P(Z = 1)}{1 - P(Z = 1)}\right) = \beta_0 + \sum_{i=1}^{6} \sum_{j=1}^{J_i - 1} \beta_{ij} D_{ij} + \beta_7 D_7 + \varepsilon \tag{3.13}$$

Model 1.4 adds the respondents' cultural identity group as described in Sect. 2.2 to account for the variability in returns to education. This is the only Indigenous-specific factor included in this analysis. This is included to control for the differences in returns to education between those with treaty rights to education (Status First Nations and Inuit) and those whose treaty rights to education were not recognized (Non-Status First Nations and Métis). It is also, however, important to see if factors that are specific to Indigenous peoples are resulting in lower earnings returns to education and subsequently driving decisions towards lower levels of education with more immediate and potentially larger returns.

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \sum_{i=1}^{7}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \sum_{k=1}^{4}\beta_{8k}D_{8k} + \varepsilon \tag{3.14}$$

Where:

- Y = Employment income (Table 3.6.1)
- β_0 = Intercept or Constant
- D_{ij} = A dummy variable for category j of variable X_i
- X_1 = Highest level of educational attainment
- X_2 = Age bracket
- X_3 = Job tenure
- D_4 = Dummy variable: employment status
- X_5 = Occupational category
- X_6 = Occupational Skill
- D_7 = Dummy variable: sex
- X_8 = Cultural identity group

3.6.4 Estimate Reliability

The following analysis is performed after applying person-level weights and 681 bootstrap weights with 681 bootstrap specifications, as prescribed in the literature accompanying the dataset (Vongdara et al., 2018, 2020; Analyzing Survey Data, 2014). These weights were created by Statistics Canada specifically for the 2017 APS to account for complexities inherent in the multi-phase stratified random sampling design and to ensure the reliability of statistical tests (Sect. 3.6.1). These complexities include units not sent to collection, non-response, partial response, extreme weights, post-stratification, and groups not enrolled under the Nunavut Agreement. Once applied, these weights allow for the results to be generalised to all Indigenous peoples over 15 living in private dwellings off reserve, excluding the Nations and communities that were not surveyed. While the bootstrap weights greatly simplify the variance estimation (Yung, 1997), it is necessary to correct for bootstrap subsampling by multiplying variances by a Fay adjustment factor of 16.

In Stata 18, this is done by specifying a bootstrap mean-weight adjustment of 16, bsn(16). This specifies the number of bootstrap replicate-weight variables used to calculate each bootstrap mean-weight variable in the surveyset.

Based on guidelines provided by Statistics Canada, the reliability of estimates is determined by the Coefficient of Variation (CV) of the estimate (CV = the std. error of the estimate divided by the estimate). If the CV ≤ 16.6% then the estimate is considered acceptable and requires no restrictions or special notation. If 16.6% < CV ≤ 33.3% the estimate is considered marginal and should be used with caution. Estimates falling within this range are accompanied by the letter *E* indicating the high degree of sampling variability. If the CV > 33.3% then the estimate is considered unreliable and denoted by the letter *F* (Vongdara et al., 2018, 2020).

The model fit shown at the top of Table 3.4 is determined using the "estat gof" command in Stata 18 (StataCorp., 2023). This command performs an F-adjusted mean residual test designed for logistic regressions using survey sample data using Archer & Lemeshow's (2006) goodness-of-fit for binary response variables with ten quantile groups. Goodness-of-fit tests are designed to assess how well the model is able to describe the observed data. It does this by calculating its overall departure from observed data using the deviation of the residuals for the model estimates. With survey data, it cannot be assumed that the observations are independent and identically distributed and require corrections to account for survey design (Archer & Lemeshow, 2006). With this test, the model is considered to be a good fit for the data if the F-adjusted mean residual test statistic is not significant at the 0.05 or 5% level. In other words, if (Prob > F) > 0.05.

3.7 Model 1 Results

Table 3.4 lists the results of Model 1.1-1.4 with the coefficient estimates for each variable along with stars indicating its statistical significance, a letter indicating the reliability of the estimate, and the bootstrap standard errors in brackets. The model statistics and goodness-of-fit test results including the F-adjusted mean residual test statistic are presented at the top of Table 3.4. The F-adjusted mean residual test statistic for all four models is well above the 0.05 threshold indicating that they are a good fit for the data. Lastly, to help interpret the results, an additional table with the observed coefficients from Model 1.4 expressed as relative risk ratios is provided in Table A.1.5.

Table 3.4: Model 1 – Results and Goodness-of-fit.

	Model 1.1	**Model 1.2**	**Model 1.3**	**Model 1.4**
Number of observations =	9,863	9,845	9,845	9,845
Population size =	487,496	486,501	486,501	486,501
Replications =	681	681	681	681
Design df =	1,000	1,000	1,000	1,000
F(9, 992) – Adjusted =	0.4500	0.8300	0.9800	1.3400
Prob > F – Adjusted =	0.9087	0.5928	0.4550	0.2123

	Coeff. (Std. err.)	Coeff. (Std. err.)	Coeff. (Std. err.)	Coeff. (Std. err.)
$Y_i = \begin{cases} 0, & if\ income\ <\ \$30{,}000\ \text{CAD} \\ 1, & if\ income\ \geq\ \$30{,}000\ \text{CAD} \end{cases}$	(base outcome)			
Constant	-3.406*** (0.437)	-3.089*** (0.453)	-3.088*** (0.449)	-3.138*** (0.449)
Grade 8 or equivalent or lower	(base outcome)			
Some secondary education	0.260 F (0.243)	0.200 F (0.258)	0.214 F (0.261)	0.227 F (0.261)
Secondary school diploma or equivalent	0.792 F*** (0.227)	0.902 E*** (0.232)	0.950 E*** (0.236)	0.960 E*** (0.239)
Some postsecondary education	0.747 E** (0.233)	0.745 E** (0.242)	0.822 E*** (0.247)	0.836 E*** (0.249)
Postsecondary certificate or diploma below bachelor level	1.236 E*** (0.213)	1.089 E*** (0.221)	1.203 E*** (0.225)	1.214 E*** (0.229)
Bach. degree or univ. certif./dip./degree above bach. level	1.767*** (0.239)	1.528 *** (0.253)	1.616*** (0.256)	1.631*** (0.261)
Between the ages of 15 and 18	(base outcome)			
Between the ages of 19 and 24	1.562 E*** (0.387)	1.532 E*** (0.381)	1.509 E*** (0.374)	1.507 E*** (0.374)
Between the ages of 25 and 34	2.502*** (0.387)	2.389*** (0.381)	2.391*** (0.374)	2.388*** (0.374)
Between the ages of 35 and 44	3.134*** (0.396)	3.020*** (0.396)	3.020*** (0.391)	3.017*** (0.390)
Between the ages of 45 and 54	2.950*** (0.392)	2.845*** (0.390)	2.860*** (0.382)	2.858*** (0.382)
Age 55 and over	2.540*** (0.394)	2.390*** (0.393)	2.395*** (0.386)	2.388*** (0.385)
Began working in 2016 or 2017	(base outcome)			
Began working between 2011 and 2015	0.860*** (0.0917)	0.892*** (0.0958)	0.903*** (0.0964)	0.904*** (0.0967)
Began working before 2011	1.617*** (0.105)	1.627*** (0.111)	1.619*** (0.112)	1.620*** (0.112)
Full-time employment	(base outcome)			
Part-time employment	-2.427*** (0.105)	-2.207*** (0.110)	-2.152*** (0.111)	-2.151*** (0.111)
Trades, transport and equipment operators and related…	(base outcome)			
Manufacturing and utilities		-0.144 F (0.204)	-0.0242 F (0.202)	-0.0295 F (0.203)
Natural resources, agriculture and related production occupations		0.406 F (0.253)	0.455 F (0.256)	0.440 F (0.256)
Sales and service		-1.238*** (0.125)	-0.913*** (0.134)	-0.918*** (0.134)
Art, culture, recreation and sport		-1.982*** (0.277)	-1.577 E*** (0.276)	-1.588 E*** (0.278)
Education, law and social, community and		-1.011***	-0.588 E***	-0.594 E***

government services		(0.145)	(0.156)	(0.156)
Health		-0.807 E***	-0.299 F	-0.308 F
		(0.186)	(0.199)	(0.199)
Natural and applied sciences and related		-0.0992 F	0.0921 F	0.0912 F
		(0.218)	(0.225)	(0.227)
Business, finance, and administration occupations		-0.280 F	0.167 F	0.158 F
		(0.144)	(0.158)	(0.158)
Management		-1.017 E***	-0.750 F**	-0.759 E**
		(0.253)	(0.253)	(0.251)
D - On-the-job training is provided	(base outcome)			
C - Secondary school and/or job-specific training		0.131 F	0.146 F	0.147 F
		(0.140)	(0.143)	(0.143)
B - College education or apprenticeship training		0.618 E***	0.583 E***	0.580 E***
		(0.146)	(0.153)	(0.153)
A - University education		1.125 E***	1.070 E***	1.067 E***
		(0.195)	(0.198)	(0.198)
Male	(base outcome)			
Female			-0.675***	-0.671***
			(0.0960)	(0.0959)
Single identity - Status First Nations	(base outcome)			
Single identity - Métis				0.0867 F
				(0.0860)
Single identity - Inuk (Inuit)				0.126 F
				(0.116)
Multiple Aboriginal identities				0.104 F
				(0.313)
Aboriginal responses not included elsewhere				-0.646 F
				(0.510)

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)
*Standard errors in parentheses: * = p < 0.05, ** = p < 0.01, *** = p < 0.001*
Acceptability of sampling error variability: E = use with caution, F = unreliable

3.8 Post Estimation Analysis: Determinants of Employment Income

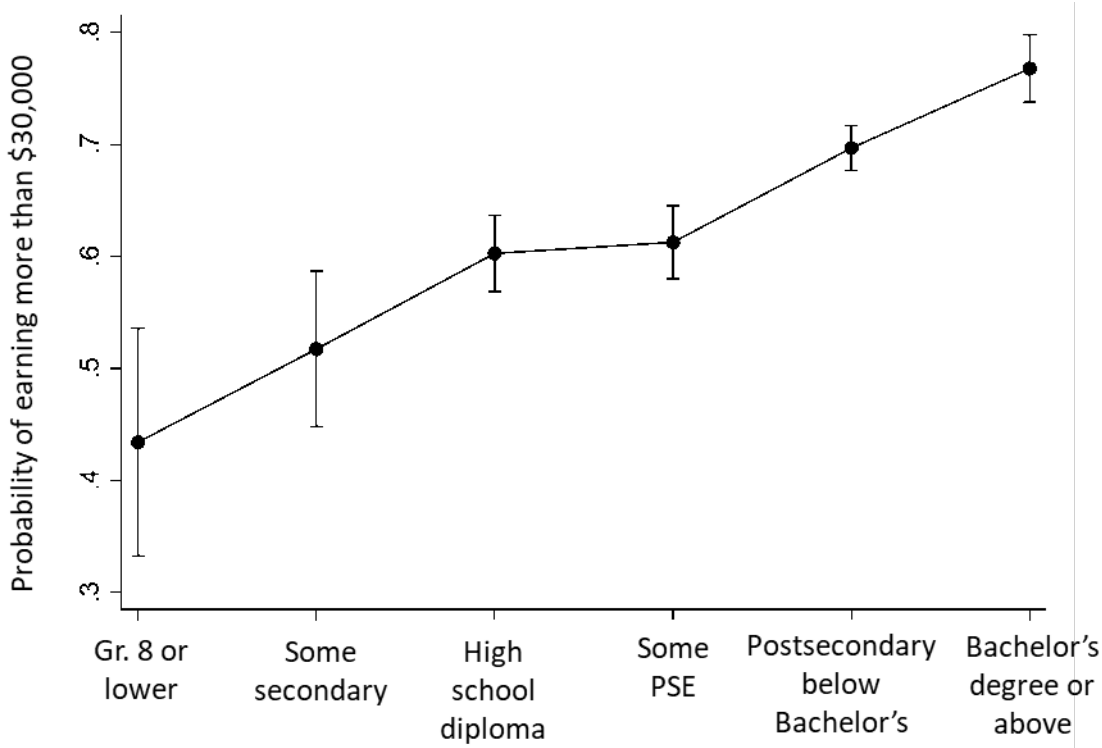
3.8.1 Education and Postgraduation Income

Table 3.4 shows that there is a strong relationship between education and the likelihood of being in the high-income bracket. This is evidenced not only in the positive coefficients and tests of significance, but also in the magnitude of the coefficients that increase with education. For example, someone with a high school diploma is 2.6 times more likely than someone with a grade 8 education or lower to earn an income that places them in the high-income category. Similarly, the likelihood of being in the high-income category is 3.4 times higher for a postsecondary graduate below the bachelor level and 5.1 times higher for someone with a bachelor's degree or above (Table A.1.5).

Fig. 3.7 is a postestimation plot for education level in Model 1. It shows the predicted probability that Indigenous peoples with different levels of education will earn more than $30,000 per year in employment income after controlling for all other covariates. The dots represent the mean predicted probabilities for

each education level, and the vertical bars represent the 95% confidence intervals. This shows that the probability of earning higher employment income increases with education and that the increased probability becomes relatively more certain.

Figure 3.7: Postestimation plot of education level and income category.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

3.8.2 Discipline, Occupation and Income

The relationship between major field of study, occupational sector and postgraduate employment income is also relevant to this discussion. These results show that the occupational categories accounting for a greater percentage of employment are not those that provide these employees a higher income. For example, someone in sales and service occupation is 60% less likely than someone in the trades and 70% less likely than someone in management to be in the high-income category (Table 3.4). According to the descriptive statistics presented in Table 3.3, sales and service is also the largest occupational category employing over 28% of the working population. The next most popular occupational categories following the base outcome are all either negatively related to employment earnings, insignificant or unreliable. Occupations in sales and service, art, culture, recreation and sport; education, law and social, community and government services, and management are all significant and decrease the likelihood of being in the high-income category than the base outcome—Trades, transportation, equipment operator and related. These four categories of occupations represent over half of the working population.

Previous studies have shown that there tends to be an employment mismatch within the Indigenous population which is especially prominent in postsecondary qualifications below a bachelor degree (Park, 2021). It is therefore possible that the occupational categories where Indigenous peoples are employed are not consistent with the level and discipline of their training. Population estimates shown in Table A.1.2 indicate that the most popular major field of study amongst postsecondary graduates are "Business, Management and Public Administration" (21.5%), "Architecture, Engineering and Related Technologies" (21.1%), and "Health and Related Fields" (14.8%). While these fields are not directly comparable to the National Occupational Classifications used in the study (Statistics Canada, 2016), they suggest a mismatch between major field of study and occupation after graduating.

3.8.3 Other Determinants of Employment Income

As described in Sect. 2.2 and 3.3, there are significant differences in both the rates of educational attainment and employment income amongst Indigenous identity groups. Despite this, the results of these tests show that Indigenous identity group is not a significant determinant of employment income. All identity groups including multiple identities and self-identified are neither significant nor reliable after controlling for the cornerstone determinants of employment income from the labour economics literature. This is not, however, unprecedented. Wilson & Macdonald obtained similar results in both the effect of education level and identity group (D. Wilson & Macdonald, 2010). While they show modest increases in median employment income from high school to trade certificate, there is virtually no difference between trades and college degrees as well as amongst different identity groups. The most dramatic increases occur when students graduate high school and when they earn a university degree at or above a bachelor level. Despite not being directly comparable, their findings are strikingly similar to those we produced with a different data set collected 15 years later.

Females are also found to be significantly less likely to earn incomes that place them in the high-income bracket. This is true for the entire population as well as in Model 2 where the sample is restricted to postsecondary graduates. In both cases, the likelihood that females will earn above $30,000 in employment income is approximately 50% less than males. In other words, they are only half as likely as males to earn more than $30,000 per year in employment income after controlling for other determinants of employment income. This is consistent with previous studies focusing on wage disparities amongst minority populations. For example, Wilson & Macdonald (2010) found that Indigenous females with a bachelor's degree earn substantially less than their male counterparts. This wage gap is, however, pervasive in many parts of the world and not unique to the Indigenous population in Canada. In fact, the wage gap between males and females in Canada is less pronounced amongst the Indigenous population even after controlling wage

disparities between the Indigenous and non-Indigenous population (Preston, 2008; D. Wilson & Macdonald, 2010).

3.9 Conclusion

The goal of this chapter is to attempt to provide a potential explanation for the education gap which can be used to inform policy recommendations that will both help to close the gap and improve labour market outcomes for Indigenous students. We approached this task by reviewing the labour economics literature in search of theories that could provide insight into an inconsistency between attained levels of education and employment earnings. We draw mainly on HCT and ST, both of which have proven robust in modelling labour market outcomes for students and lifetime earnings trajectories (Weiss, 1995).

Based on the labour market outcomes presented in Sect. 3.3 and 3.4 combined with the descriptive statistics presented in Sect. 2.2, theory suggests that we would observe the opposite of what we are seeing. There would be a reverse education gap where the Indigenous population would have disproportionately more university degrees than the non-Indigenous population. We would also observe relatively more Status First Nations and Inuit peoples with university degrees than Métis and Non-Status First Nations. This presents an empirical inconsistency when economic theory is considered against the educational attainment of Indigenous peoples in Canada.

In a series of regressions, I systematically tested the cornerstone determinants of employment income from well-established theories representing different schools of thought. Importantly, all of these theories are anchored in the assumption that decisions to pursue PSE are primarily driven by financial benefits. The analysis begins by testing the gold standard of income estimation, the Mincer model as expressed in Eq. 3.7. This model describes the relationship between employment earnings, years of schooling (found to be linear to log earnings), years of work experience (found to be a quadratic function of earnings) and age (earnings are found to be concave with age) (Mincer, 1958). While the 2017 APS does not allow for direct comparisons, Model 1.1 produces results that are consistent with expectations under the Mincer model. All three cornerstone factors are statistically significant, their relationships to earnings resemble those described in Mincer's seminal work and they are robust when groups of variables are subsequently included. Earnings and age follow a concave pattern peaking between the ages of 35 and 44, earnings increase with levels of education, and job tenure drastically increases earnings.

Model 1.2 adds two additional variables expected to be significant according to Signalling Theory, occupational category and skill level. Occupational skill level and occupational category are used as a proxy to approximate the central tenet of ST and that which differentiates it from HCT—that education level is a

signal of talent and higher paying occupations require a higher level of education making them inaccessible to those less talented. The results of skill level are consistent with expectations under the credentialist approach—the greater the skill level required, the more income provided. This effect is unambiguously positive even after controlling for age, education and experience. Model 1.3 then adds sex of the respondent since it is central to many of the criticisms of the Mincer model and HCT more broadly. The results are significant and consistent with prior literature and expectations in the presence of other determinants. Lastly, the inclusion of Indigenous identity groups in Model 1.4 tests to see if income disparities can be attributed to intracultural variations described in Sect. 2.2. Identity groups are not found to have an effect on employment income nor does including them change the magnitude, significance or reliability of any of the theory-driven factors.

In sum, since the results of these tests are consistent with expectations and that of the general population, these theories do not provide an explanation for the education gap. Provided there are no other rational explanations which could account for the gap, then we must reject the assumption underlying these theories—financial incentives are driving decisions to pursue PSE.

3.10 Limitations and Future Work

3.10.1 Limitations

The logistic regressions presented in this paper are conducted using the Public Use Microdata File (PUMF). Performing these tests on the PUMF rather than the Statistics Canada master file presents some limitations. First, many factors that are of interest in this study are not included in the PUMF such as major field of study, area of residence and family background. This not only limits the tests that may be performed but also the ability to control for influential factors potentially leading to omitted variable bias. Furthermore, many of the variable categories have been combined in the PUMF which limits the interpretability of the results. Notably, First Nations peoples living on reserves from January 16 to August 15, 2017 are not reflected in these findings. Since most universities, research institutions and potential employers are located off reserve, excluding them would not likely impact the findings. It should, however, be noted that these findings are not reflective of all Indigenous peoples living in Canada and any actions resulting from this work should take this into consideration.

3.10.2 Future Work

Future research should focus on unpacking the behavioural and contextual factors driving educational decisions and career choices amongst Indigenous students in Canada. This includes a deeper investigation into the association between choice of discipline, level of education, and Indigenous-specific factors known to influence these decisions. More specifically, the volume Indigenous postsecondary graduates with degrees in fields largely considered antithetical to Indigenous ways of being and doing (i.e., Business, Management and Administration) warrants further investigation into the causes of this demand. Most importantly, this study indicates a need to re-evaluate financial incentives as a universal basis for decision making, considering differences in the relationships that minority groups have with money through a trauma-informed lens. Further research is also warranted to investigate if the lack of interest of Indigenous peoples in technology-related fields is linked to the availability of high speed internet in rural communities or the underfunding of on-reserve schooling (GoC, 2017b; Taskinen et al., 2013).

4 The Impact of Access and Preference Factors on Indigenous Student Engagement in Postsecondary Education in Canada

4.1 Introduction

Many of life's most important decisions are complex and inherently emotional—decisions to marry or have children, where to live, what to do for a living—not the least of which is whether to commit to a career path or several years to earn a degree. These decisions are intimately connected to personal goals, sense of identity, social influences, individual perceptions and the availability of information. These decisions cannot be reduced to figures on a balance sheet nor fully understood by simply weighing the objective costs and benefits. Currently, there are gaps in our understanding of how these decisions are formed and the non-financial factors that influence participation in postsecondary education (PSE). With a more descriptive understanding of factors influencing Indigenous students' decisions to pursue different levels of PSE we can better inform policies and practices that will encourage more youth to pursue paths that will increase the economic wellbeing of students and their respective communities.

Chapter 2 described how the relationship between Indigenous peoples and education evolved since contact with European explorers and the enduring intergenerational trauma that resulted. A preliminary analysis revealed that Indigenous peoples belonging to the identity groups with the highest returns to PSE—Status First Nations and Inuit—have disproportionately lower rates of educational attainment than the two groups without treaty rights to education—Métis and Non-Status First Nations (Sect. 2.2).

Chapter 3 then investigated educational disparities from the perspective of some of the most widely accepted and robust economic theories of action, motivation, and decision. Building on an extensive body of literature from around the world and across multiple disciplines, we tested the cornerstone determinants of employment income proposed by Human Capital Theory (HCT) and Signalling Theory (ST) on the Indigenous population in Canada using the 2017 APS. Findings confirm the descriptive statistics presented in Sect. 2.2 and 3.4—that the education gap is most prominent in qualifications the highest earnings premiums, university degrees at or above the bachelor level. Moreover, these findings are consistent with a large body of literature indicating that these theories are equally well-suited to estimating employment income for Indigenous peoples in Canada. This calls into question the underlying assumption that these decisions are driven primarily by financial returns and therefore theories assuming money-maximizing rational actors are foundationally ill suited to explain these educational disparities.

This chapter attempts to move beyond transactional decision processes and notions of rational actors treating educational and career decisions as financial investments. It instead presents a more holistic understanding of the decisions of Indigenous postsecondary graduates in Canada to complete a university degree over other postsecondary qualifications. It is intended to provide insight into why the education gap exists and the role of postgraduation income and other factors influencing decisions to pursue different levels of education. This is approached by extending the analysis of the 2017 APS to include access and preference factors drawn from the literature and by limiting the scope of these tests to postsecondary graduates where the gap is most pronounced. These factors include sense of belonging, residential school attendance, guidance received, sources of funding, and reason for program choice alongside several demographic and socioeconomic factors known or believed to influence these decisions.

Two hierarchical logistic regressions are used to explore the relationships between postgraduation earnings, several preference and access factors, and rates of university attainment amongst postsecondary graduates. The first regression (Model 2; Sect. 4.6.1) tests the cornerstone determinants of employment earnings from Chapter 3 and additional factors specific to postsecondary graduates against employment earnings. The second (Model 3; Sect. 4.6.2) explores the relationships between the highest level of education and several factors affecting both access to and preferences in pursuing PSE. The results of these tests reveal a number of significant non-financial determinants which are presented as a frame of reference consisting of four categories of factors—barriers, enablers, motivators, and demotivators.

This study provides little evidence to support the proposition that Indigenous students pursue PSE primarily for financial incentives as proposed by HCT (Sect. 3.2.3) and ST (Sect. 3.2.5) and other theories which assume money-maximizing rationality as a universal principle. Instead, these students tend to be more driven to choose educational paths that align more closely with their culture and values, often at the expense of future earnings. More specifically, the primary motivators for pursuing PSE are found to be either unrelated or negatively related to postgraduation income (Table 4.8). In fact, the two strongest motivators to pursue university degrees, personal interest and wanting to help their community, are the only two of the six reasons for postsecondary program choice in the 2017 APS that do not impact the net present value of PSE as described in Sect. 3.2.

Findings indicate that all statistically significant reasons for program choice affecting the likelihood of completing a university degree amongst Indigenous postsecondary graduates relate to personal or internal motivations and reasoning. In this respect, students are more often self-directed and driven by their own deliberations and rationalizations. Advice from others such as guidance and recommendations, are neither found to influence these decisions nor the likelihood of earning a higher postgraduation employment income. Sources of funding are also found to significantly affect the likelihood that Indigenous students

will go on to complete a university degree. Most Indigenous postsecondary graduates rely solely on funds from other parties to pay for their education. These individuals are 2.8 times less likely to complete a university education at or above the bachelor level than those who use a mix of their own funds and funds from other sources and 1.44 times less likely to end up in the high-income bracket after graduating than those who self-fund their PSE (Table 4.9).

These findings also provide strong evidence supporting the negative relationship between higher education and residential school attendance amongst survivors and their descendants. The magnitude and significance of this relationship increase with the proximity of the respondent to the residential school survivor which supports claims of intergenerational trauma experienced by their descendants. Lastly, these findings raise concerns over the government funding programs which may be amplifying and perpetuating the gap in university attainment rates by either incentivizing these students to delay their studies or by restricting the options available to them.

4.2 Literature Review

In 2001, Looker and Lowe acknowledged the need to develop a deeper understanding of the role that perceptions play in educational and career decision-making (Looker & Lowe, 2001). In the same paper they also identified a need for further research "[...] to examine the resources and support available for [Indigenous] students, and the unique problems it is likely that they encounter when participating in PSE." Since then, efforts have been made towards developing a more fulsome understanding of these decisions which considers the unique histories of Indigenous peoples in Canada.

Several factors need further exploration to better understand the educational disparities including a number of barriers that prevent many from participating in PSE. These barriers include the underfunding of on-reserve schools (Ottmann, 2017), colonialism and expectations of racism (Pidgeon et al., 2014), incompatibility with on-reserve education, sociocultural and socioeconomic challenges (Julien, 2016), as well as intergenerational barriers such as parental educational attainment and the effects of residential schools (Deller et al., 2019). Some of the most commonly reported barriers to graduate education for Indigenous students include racism (Archibald & Bowman, 1995; D. A. Clark et al., 2014), insufficient postsecondary funding (Deonandan et al., 2019), and ingrained colonial structures that Indigenous students perceive as being unwelcoming or unaccepting of Indigenous ways of knowing and being (Pidgeon et al., 2014). Experiences of racism or expectations of racism was found to be a key factor in the reviewed literature and often takes the form of microaggressions on campus (D. A. Clark et al., 2014).

Deonandan, Janoudi & Uzun, (2019) reviewed the literature on Indigenous educational experiences in Canada with a focus on barriers to PSE (Deonandan et al., 2019). Five themes emerged over the course of their review including fear of losing their Indigenous identity; fear of being estranged from their community and support network; expectations of racism and fear that their traditions will be disrespected; insufficient funding; and ongoing family obligations. Pidgeon, Archibald & Hawkey (2014) collected stories from Indigenous graduate students across British Columbia, Canada with the goal of better understanding Indigenous student transitions from undergraduate to graduate studies (Pidgeon et al., 2014). Student experiences analysed through the emotional, intellectual, spiritual, and physical realms of human development indicate that many Indigenous students face challenges navigating graduate studies and ingrained racism in institutions. Factors found to hinder Indigenous undergraduates' access to and interest in PSE, in particular graduate programs, include racist encounters, low grades, funding, unwelcoming learning and social environment and a perceived depersonalised and colonial institutional attitude.

The remainder of Sect. 4.2 describes factors that have been found or are believed to influence decisions to pursue or complete a PSE for Indigenous peoples in Canada. Table 4.1 lists eleven of the main barriers organized by proximity to the individual-level decisions. These factors range from individual-level preferences to deep-seeded systemic barriers. Accompanying these factors are a number of corresponding theories from various disciplines which provide explanations for their effects on the rates of educational attainment. Each of these factors are then explained in greater detail in the following sections.

Table 4.1: Nested model of barriers to PSE by proximity to individual decisions.

Category	Factor	Supporting Theories
Systemic & Cultural	Tracking to trades schools/college	
	Underfunding of on-reserve schooling	
	Colonialism and racism	Social identity theory
	Incompatible worldview & epistemology	Cultural reproduction theory
	Social exclusion	Social identity theory
Relational & Community	Geographic dispersion	Self-determination theory
	Ongoing familial responsibilities	
	Ongoing community responsibilities	
	Intergenerational trauma - Residential Schools	Developmental networks theory
	Parental influence	Social reproduction theory
Personal or Individual	Self-efficacy, self-esteem	Bandura's social cognitive theory
	Biases and perceptions	Perceived costs/benefits, price sensitivity
	Access to capital	Loan aversion

Source: Author's analysis based on a review of the literature.

4.2.1 Systemic and Cultural Barriers

4.2.1.1 Underfunding of On-Reserve Schools

An underlying factor responsible for the lower rates of education among Indigenous students is the systemic underfunding of schools in their home communities. A recent study showed that federally funded schools located on reserves would need a 20% increase in funding to equal the provincial funding provided to all other schools across Canada (Ottmann, 2017). The effects of this underfunding are felt in these communities whose schools are often ill-equipped to prepare students for higher education (RCAP, 1996a). This is most prevalent in remote communities that rely on the virtual delivery of primary and secondary education. Not only are these schools unable to offer students face-to-face interactions with subject matter experts, but few even offer the upper-year courses that are prerequisites for most university programs (GoC, 2017b). In essence, all students educated in these communities and who follow the expected educational path would be ill-prepared and ineligible for most university programs. A report published by Statistics Canada in 2017 found that on-reserve schools are limited in their ability to hire and retain good quality teachers, as is their ability to hire counsellors and teacher's aides, and to provide ongoing professional development. This funding gap also limits the ability of these schools to provide extracurricular activities, up-to-date books, science labs and modern technology that would help promote student interest in higher education (GoC, 2017b; Taskinen et al., 2013).

4.2.1.2 Tracking to Trade Schools and Colleges

Many Indigenous students in Canada are tracked into remedial classes and college preparation courses, and away from the courses that would provide them the prerequisites necessary to go to university (Brayboy & Maaka, 2015). These practices can be traced back to the 19th century when a legally recognized Indigenous person could not hold a university degree (Kirkby, 2019). Another notable example can be seen in the Industrial School Model in 1847 which served as the framework for Canada's infamous residential school system (Sect. A.5.4). These institutions intentionally offered limited intellectual training, focusing instead on teaching children agricultural and kitchen skills. There are many well documented examples of these practices in Canada, however, this is not a historical issue. They are still commonplace in many communities and are closely related to the under-representation of Indigenous peoples in higher education. These practices are common in large urban centres, though it is especially pronounced in remote communities with federally funded educational systems.

4.2.1.3 Sense of Belonging and the Incompatibility of Worldviews

The incompatibility of mainstream knowledge systems and Indigenous worldviews and ways of knowing can be seen as the product of centuries of social exclusion and subjugation. Racism against Indigenous peoples is woven into the very fabric of Canadian society and deeply embedded in the foundations upon which the country was built. Almost all public institutions in Canada evolved within structures of institutionalized racism which are rooted in the same systems and ideologies which once sought to eradicate Indigenous cultures and identities.

While much has changed, the legacies of colonialism run deep, and the academy is no exception. Many universities in Canada intentionally excluded Indigenous thoughts, experiences and perspectives. In fact, historically, Indigenous peoples could not legally hold a university degree (Kirkby, 2019). Once a degree was awarded, the graduate would be disenfranchised and no longer legally recognized as Indigenous (Sect. A.5.4). The belief in the superiority of mainstream epistemologies that undermine or invalidate alternative ways of knowing is still prevalent in many Canadian institutions and beyond. Readers are referred to Sect. A.4 for an overview of some of the differences between Indigenous ways of knowing, being and how they conflict with colonial and capitalist structures.

4.2.2 Relational and Community-Level Barriers

Verde (2019) conducted a qualitative study exploring Indigenous student retention at the University of Northern British Columbia through the three central tenets of Self-Determination Theory (SDT)—autonomy, competence, and relatedness. One of the more significant motivators influencing decisions to pursue PSE lies in their sense of belonging and strong community orientation. He finds that Indigenous students often feel motivated to succeed by a desire to contribute to the wellbeing of their home communities, or to the broader Indigenous community. One of the ways students do this is by effecting change in their communities and influencing institutions that contribute to the marginalization of Indigenous peoples (Verde, 2019). When examined through a lens of SDT, Verde's findings suggest that individuals seek education in order to increase their autonomy by developing competences enabling greater self-reliance, and ability to impact their communities.

4.2.2.1 The Residential School System and Intergenerational Trauma

Though the residential school system was eventually discontinued and later condemned by the GoC, the trauma they caused endures. The scope of this devastation is almost inconceivable. Governments and religious organizations in Canada used legislation to transform treaty rights to education intended to

promote Indigenous prosperity and engagement in the Canadian economy into a tool for cultural genocide. Their actions effectively alienated an entire race of people from mainstream education and, with it, their ability to pursue professional careers or engage meaningfully in the Canadian economy.

The residential school system and the resulting intergenerational trauma can be directly attributed to many of the contemporary issues faced by Indigenous communities today and continue to shape Indigenous students' demand for higher learning. These factors include a widespread distrust of public and research institutions, delayed cognitive development, perceptions of academia and educational systems, loss of culture and identity, sense of belonging, and sense of self-efficacy (Barnes et al., 2006; Deller et al., 2019; Pidgeon et al., 2014; *RCAP*, 1996b; TRC, 2015b). These effects are especially pronounced in university education since these institutions were in some cases responsible for the harm inflicted on children in these schools (MacDonald et al., 2014). Readers are referred to Sect. 2.2 for more information on residential schools.

4.2.2.2 Geographical Barriers

Almost half of the Indigenous population in Canada lives in urban centres like Winnipeg, Edmonton, Vancouver, Toronto, and Montreal and increasingly more are choosing to move away from their reserves to live in large urban centres. From 2016 to 2021, the urban Indigenous population has grown by 12.5% compared to a population growth of under 8% in rural areas (Statistics Canada, 2022). This has largely been influenced by factors such as employment opportunities, access to education, healthcare, and social services as well as the potential for cultural and social connections within diverse urban environments, and a desire to make positive impacts on urban Indigenous communities (GoC, 2017a). Relocating to larger cities offers several advantages such as networking opportunities and increased access to markets and resources (Mika et al., 2017). These benefits, however, come at a cost and present some unique challenges which include maintaining their cultural identity and connection to land, ongoing familial and community responsibilities, and addressing social disparities.

Students living in rural areas or whose home communities are located further away from universities are less likely to move to large urban centres where these schools are most often located. This is especially true for the Inuit populations in the territories and is likely one of the factors contributing to educational disparities amongst Indigenous identity groups (Sect. 2.2). Currently, there are only four postsecondary institutions located in the territories servicing 59 Indigenous Nations and communities across almost four million square kilometres. In Canada, there are 258 public and private universities (ISED, 2022b), 618 community colleges and C.E.G.E.P.s (Canadian Ind. Stat. - 6112, 2022), and 1,700 technical and trade schools (ISED, 2022a). Of those 258 universities, most are located in large urban centres, while many of

the over 2,000 colleges and trade schools are located nearer to rural communities (List of Universities in Canada, 2025).

Despite significant differences amongst Indigenous Nations and cultures, many share a strong community orientation and deep-seeded connection to their land and traditional territories. In fact, ongoing family obligations and community responsibilities have been identified as one of the five most significant barriers to PSE faced by Indigenous students (Deonandan et al., 2019). This makes it especially difficult for those living in rural communities to move to larger urban centres where universities are most often located. The proximity of schools to students' home communities as well as the size and remoteness of the community therefore likely influences the level of education they decide to pursue.

4.2.2.3 Guidance and Role Models

The Aboriginal Transitions: Undergraduate to Graduate (AT:U2G) research project out of the University of British Columbia outlines a graduate studies transition framework developed from a series of interviews, sharing circles and online surveys with Indigenous graduate students in B.C., Canada. Their findings highlight the importance of belonging and interconnectedness as primary motivators and support systems. Peer and faculty mentoring programs are found to fostering a community-oriented network of Indigenous graduate students as well as a space for Indigenous knowledge and skills to exist within the university (Pidgeon et al., 2014).

Many Indigenous university students today are first-generation learners with limited access to information and guidance. These students also often feel pressured to succeed and, in some cases, feel that it alienates them from their home communities. In 2008, a team of researchers found that females are twice as likely to attend university, first-generation students half as likely, and encouragement from significant others is an important factor in predicting the likelihood of university participation (Côté et al., 2008).

4.2.3 Personal or Individual-level Barriers

4.2.3.1 Sources of Funding and Access to Capital

Historically, First Nations peoples were required to register with the GoC to receive their treaty rights and there are strict rules governing who can claim status and how that status can be passed down. First Nations peoples who registered with Indian and Northern Affairs Canada (INAC) were provided with a status card and labelled "Status Indians" (henceforth Status First Nations). This status is therefore only extended to First Nations. Inuit and Métis peoples were not included in these treaties and therefore not considered to

have the same inherent rights to education. Despite this, the GoC would provide limited funding for Inuit students through a support program administered by First Nations administrators operating in southern centres.

In 1968, the GoC created a national program called Post-Secondary Educational Assistance and continued to provide funding for First Nations students who were accepted and enrolled in postsecondary institutions (Carr-Stewart et al., 2013). This program was subsequently replaced by the Post-Secondary Student Support Program in the 1970s and administered by INAC. It is reported that INAC supported 3,600 Indigenous postsecondary students in 1977-78 compared to 27,000 in 1999-2000 (Usher, 2009) after they relinquished the administration and allocation of funds to individual First Nations in the early 1990s.

In 1996, the Royal Commission on Aboriginal Peoples called for significant changes to the educational system and that the GoC fulfil its obligations to treaty Nations by offering a full range of educational services including PSE. Later that same year, the Liberal government placed a two percent limit on annual increases to the budget provided to First Nations. These changes severely limited the number of students who could obtain funding for PSE and remained in effect for the following two decades. To this day, the demand for PSE far exceeds the funds provided by the government and bands across Canada have been forced to impose strict funding conditions and systems that prioritise newly graduated high school students. Some bands have reported turning away more than twice as many qualified applicants and often returning students are among the last to be considered (Monkman, 2016).

In 2016, the rights of Métis and Non-Status First Nations peoples to education were formally recognized following a unanimous Supreme Court of Canada ruling that all Métis and Non-Status First Nations would be considered "Indians" under Section 91(24) of the 1867 Constitutional Act (Fontaine, 2016). Also in 2016, the current Liberal government committed funding for Indigenous programs that exceeded the two percent funding cap by 22 percent (Budget 2016, 2016). This budget included a $3.7 billion commitment for First Nation education and plans to overhaul the on-reserve education system.

Currently, there are separate federal funding programs in place for First Nations, Inuit, and Métis peoples. The Post-Secondary Student Support Program is the largest and provides funding for Status First Nations postsecondary students through local band offices and regional Indigenous Services Canada offices. The next largest is the Métis Nation Post-Secondary Education Strategy which provides financial support for Métis postsecondary students through six national Métis governments. Lastly, the Inuit Post-Secondary Education Strategy provides financial support for Inuit postsecondary students. Prior to the implementation of the Inuit Post-Secondary Education Strategy in 2019, Inuit students were eligible for limited funding through the Post-Secondary Student Support Program administered by First Nations. Since these changes

were made after the data used in this study was collected, the implications of these changes are not reflected in these analyses.

In addition to band funding programs financed through treaty payments, there are hundreds, possibly thousands, of Indigenous-specific scholarships, awards, bursaries, grants, and other support programs administered by universities and colleges, private and public companies, individuals, and independent organisations. Moreover, all students in Canada can apply for loans and non-repayable grants. The Canada Student Financial Assistance Program is designed to provide sufficient access to capital for all qualifying students who want to obtain a PSE. These assistance programs are based on financial need and administered in partnership with participating provinces and territories. Students enrolled in eligible postsecondary institutions can receive enough funding to cover tuition and a portion of living expenses every year. These loans are paid back over a ten-year period, and no interest accrues while the student completes their studies.

4.2.3.2 Perceived Returns to Education

While objective costs and benefits provide a convenient and universal basis for decision-making, some have attempted to look deeper. One possible explanation for these inconsistencies lies not in the objective costs and benefits, but rather in beliefs of the costs and benefits of education. One such approach is to calculate the perceived return on investment of PSE. Studies have shown that students who are less likely to attend university are more likely to overestimate the costs (Junor & Usher, 2004; Usher, 2005). Another study also find negative correlation between estimates of the costs and benefits of PSE creating a double inaccuracy that is more pronounced in lower-income families (Côté et al., 2008). It is therefore possible that many Indigenous students choosing to pursue postsecondary programs below university may have chosen differently had they estimated the costs and benefits more accurately.

In 2008, researchers conducted a study to see if they could reliably measure Ontario high school students' perceived returns to education and if that measure could predict participation in PSE (Côté et al., 2008). Perceived costs and benefits of PSE were measured using a 16-item scale (PRoI16) along with measures of identity anxiety and debt aversion to determine the returns on investments of time, money, and effort. Students' perceived return on investment was found to be a significant determinant of university attendance, but not when university and college attendance were combined into a single dependent variable. Grade average and increased knowledge of funding opportunities were also found to be important factors in predicting students' likelihood of attending university.

Another study adopted a slightly different approach by analysing the "willingness to pay" for six underrepresented groups in Canada including Indigenous students (Palameta & Voyer, 2010). They

investigate the extent to which loan aversion and price sensitivity act as barriers to participation in PSE. While the results of loan aversion are less definitive, their findings clearly indicate that Indigenous students are significantly more price sensitive to the cost of PSE. They find that increases in the price of PSE disproportionately decreases the demand for financial aid and these results persist after controlling for income, parental education, grades, perceived returns of PSE, time preferences, and school engagement.

While Palameta & Voyer (2010) were unable to confirm that aversion to debt is a contributing factor in the education gap, other studies indicate that it is worthy of further exploration. One Canadian study in 2009 showed that the introduction of new federal grants was followed by a 7% increase in university attendance in boys living outside of the commuting distance (Frenette, 2009). Further evidence from the United States shows that replacing loans with grants increased enrolment by 8-10% amongst low-income minority students (Linsenmeier et al., 2006).

4.3 Frame of Reference

To guide subsequent analyses and contextualize these factors within dominant worldviews and knowledge systems, all barriers, enablers, motivators, and demotivators are further distilled into the frame of reference presented in Table 4.2. Each factor affecting the accessibility and desirability of postsecondary programs is categorised as affecting either access to PSE or preferences in pursuing it and further classified as either positively or negatively affecting these decisions. Access to PSE refers to external factors affecting a student's ability to participate in PSE. For example, tracking to trade schools and colleges is a systemic barrier negatively affecting access to university education, whereas admissions policies and bridging programs enable access by mitigating that barrier. Contrary to access factors, preference factors are internal in nature and affect the desirability of PSE. These factors often relate to aspects of PSE that students perceive as being unwelcoming or unaccepting. Put simply, preference factors influence whether or not they want to go to university; access factors determine if that is even an option available to them.

Table 4.2: Frame of Reference – Access and Preference Factors.

	Access	Preferences
Positive	**Enablers**	**Motivators**
	• Funding Programs • Admissions policies & streams • Bridging programs • Partnerships with community institutions	• Postgraduation earnings • Postgraduation employment • Autonomy & self-reliance • Peer and faculty mentoring programs • Community well-being
Negative	**Barriers**	**Demotivators**
	• Tracking to trades schools or colleges • Geographic dispersion • Family responsibilities • Community responsibilities • Access to capital • Underfunding of on-reserve schooling	• Colonialism and racism • Incompatible Worldview • Intergenerational Trauma • Parental Influence • Self-efficacy, self-esteem • Over/under-estimation of costs/benefits

Source: Author's analysis based on a review of the literature.

Another important implication of this frame of reference is that many, if not all, of the factors affecting access to PSE are typically responses to tangible barriers and can be addressed relatively easily from within ingrained colonial systems and constructs. For example, access to capital often acts as a barrier to PSE that can be effectively mitigated through funding programs.

Preference factors, on the other hand, require that postsecondary institutions step outside of those familiar constructs to look at what they are doing to make these spaces and programs seem unwelcoming or undesirable for Indigenous students. These are the more complex supply-side factors that make universities in particular seem foreign to many Indigenous students and demand a more sustained effort to change organisational cultures and norms. For example, addressing the incompatibility of worldviews and ways of knowing requires a fundamental shift in the acceptance of alternative knowledge systems as equally valid. It also requires capacity-building to develop competencies within the institution to effectively evaluate students based on criteria that is appropriate for each student. According to Moodie et al. (2018),

> *"Focusing on 'barriers and enablers' to Indigenous student success can risk perpetuating discourses that render failure to succeed as an individual problem or lack of capacity. The dynamics of institutional recognition and the strategies required to welcome Indigenous identities and knowledges may be more complex than a binary distinction between blockages and facilitation."*
> (Moodie et al., 2018).

4.4 Questions and Hypotheses

4.4.1 Model 2: Educational Decision Factors on Employment Income

Q.2.1: Do the cornerstone determinants of employment income established in Model 1.4 hold for Indigenous postsecondary graduates?
H.2.1: The results of Model 2.1 will mirror those of Model 1.4 in sign, significance, reliability and magnitude.

Q.2.2-2.4: Do the sources of postsecondary funding and reasons for choosing their postsecondary program affect postgraduation employment income?
H.2.2-2.4: Assuming that decisions are driven by financial incentives, the reasons for postsecondary program choice will be positively related to and significant determinants of employment income while sources of funding will have no effect.

4.4.2 Model 3: Educational Decision Factors on University Attainment

Q.3.1: Are sources of postsecondary funding (e.g., access to capital) related to rates of university attainment?
H.3.1: Those relying exclusively on external funding will pursue less expensive postsecondary programs.

Q.3.2: Do individual-level non-financial factors including their reasons for choosing their program, guidance received and sense of belonging to their culture affect their attained level of education?
H.3.2: Non-financial factors will be positively related to higher levels of education and stronger more reliable determinants of educational attainment than financial incentives.

Q.3.3: Does residential school attendance, disconnection from culture and sense of belonging to Canada affect university attainment?

H.3.3.1: The intergenerational trauma resulting from the residential school system will negatively affect decisions to pursue university.

H.3.3.2: Those who feel a greater sense of belonging to Canada will be more likely to complete a university degree.

H.3.3.3: Those who feel a stronger sense of belonging to culture will be less likely to complete a university degree.

Q.3.4: Does identity group and sources of funding account for the variability in returns to education.

H.3.4: The magnitude of educational disparities amongst identity groups described in Sect. 2.2 when combined with disproportionate returns to education suggests that interactions between financial factors and identity groups will be significant.

4.5 Data and Methodology

4.5.1 The 2017 Aboriginal Peoples Survey

All tests in this study are performed using the 2017 APS Public Use Microdata File (PUMF) described in Sect. 3.6.1 and in the 2017 APS Data Dictionary (Statistics Canada, 2017). Like Chapter 3, all frequency reports and descriptive statistics included in this report are produced using Statistics Canada's person-level weights and all statistical tests are performed using both person-level weights and bootstrap weights described in Sect. 3.6.4 (Vongdara et al., 2018, 2020; Analyzing Survey Data, 2014).

The variables of interest in this study include several factors specific to postsecondary graduates in addition to those included in Model 1. Because of this, Models 2 and 3 are restricted to those who have earned a postsecondary credential. To avoid repetition, readers are referred to Sect. 3.6 for summary statistics and variable descriptions. The dependent variable in Model 3 is derived from the respondents' highest level of education and divided into two categories—those with a postsecondary credential at or above the bachelor level and those whose credential is below it.

Table 4.3: Summary statistics for education level with original values.

Highest Level of Educational Attainment							
Categories	**Frequency**	**Weighted Frequency**	**%**	**Code**	**Frequency**	**Weighted Frequency**	**%**
Grade 8 or equivalent or lower	1,340	48,529	4.9	.	11,172	486,240	48.8
Some secondary education	2,669	118,918	11.9				
Secondary school diploma	3,280	150,343	15.1				
Some postsecondary education	3,883	168,450	16.9				
Postsecondary below bachelor	6,384	323,807	32.4	0	6,384	323,807	32.4
Bach. degree or above	1,975	104,609	10.5	1	1,975	104,609	10.5
Valid skip	1,019	66,294	6.6	.	1,318	83,862	8.4
Don't know	0	0	0				
Refusal	0	0	0				
Not stated	299	17,568	1.8				
Total	20,849	998,517	100		20,849	998,517	100

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Age is defined similarly to Model 1 with the exception that "Between the ages of 15 and 18" and "Between the ages of 19 and 24" were merged into a single category, "Between the ages of 15 and 24." This is because none of the respondents under 18 had completed a PSE.

Table 4.4: Summary statistics for age with original values.

Age group of respondents - Reference date							
Categories	**Frequency**	**Weighted Frequency**	**%**	**Code**	**Frequency**	**Weighted Frequency**	**%**
Between the ages of 15 and 18	1,777	95,308	9.5	1	6,506	222,745	22.3
Between the ages of 19 and 24	4,729	127,437	12.8				
Between the ages of 25 and 34	2,818	181,294	18.2	2	2,818	181,294	18.2
Between the ages of 35 and 44	2,475	158,262	15.8	3	2,475	158,262	15.8
Between the ages of 45 and 54	2,733	187,232	18.8	4	2,733	187,232	18.8
Age 55 and over	6,317	248,984	24.9	5	6,317	248,984	24.9
Valid skip	0	0	0	.	0	0	0
Don't know	0	0	0				
Refusal	0	0	0				
Not stated	0	0	0				
Total	20,849	998,517	100		20,849	998,517	100

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Sources of postsecondary funding are grouped into three categories—entirely self-funded, entirely funded by other parties, and partially funded by other parties. Sources of self-funding for PSE include personal savings and income earned working while going to school. Sources of funding from other parties include the following:

- Government loans
- Grants, bursaries or scholarships
- Band funding or funding from an Inuit Land Claim organization
- Employment insurance
- Money from family (e.g., parents, spouse)
- A bank loan or line of credit
- Other source

Model 2 tests if students' reasons for choosing their program influences the likelihood that they will earn a higher postgraduation income and similarly if these reasons affect the likelihood of obtaining a bachelor's degree or above in Model 3. Respondents were asked "What were the reasons you chose this certificate, diploma or degree? Was it because…?" and responded with either yes or no. In total, there are seven reasons for program choice questions: "A lot of jobs in the field"; "Personal interest"; "Recommended"; "Good reputation"; "Length of program"; "Wanted to help community"; and "Some other reason (Other)." Notably, the latter includes money which was initially presented to respondents as a separate question and

later merged with all other reasons by Statistics Canada. Each of these variables are structured as dummy variables with "Yes" equal to one. The adequacy of the guidance that respondents received with regard to their PSE is described by its usefulness using a four-point Likert scale: "Inadequate or very inadequate"; "Neither adequate nor inadequate"; "Adequate"; and "Very adequate."

A derived variable for residential school attendance is used to control for the direct and intergenerational effects of the residential school system on the likelihood that those connected with these schools would complete a university degree. This variable is grouped into four categories based on the proximity of the connection to residential schools to the respondent—respondent attended, parent or grandparent attended, other family member/s attended, and neither respondent nor family members attended.

Table 4.5: Summary statistics for residential school attendance with original values.

Residential School Attendance							
Categories	**Frequency**	**Weighted Frequency**	**%**	**Code**	**Frequency**	**Weighted Frequency**	**%**
Neither respondent nor any family member	7,196	367,098	36.8	0	7,196	367,098	36.8
Only parent(s) / grandparent(s) / other family member	3,663	161,222	16.1	1	4,784	203,893	20.4
Only other family members attended	1,121	42,671	4.3				
Only parent(s) or grandparent(s) attend	2,293	109,205	10.9	2	2,293	109,205	10.9
Respondent attended	1,169	41,107	4.1	3	1,169	41,107	4.1
Valid skip	0	0	0	.	5,407	277,214	27.8
Don't know	0	0	0				
Refusal	0	0	0				
Not stated	5,407	277,214	27.8				
Total	20,849	998,517	100		20,849	998,517	100

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Closely related to residential school attendance are two variables describing the respondents' sense of belonging. The 2017 APS collects information on respondents' sense of belonging to their cultures and communities as well as to Canada. Since the goal of the residential school system was to eradicate Indigenous culture and assimilate Indigenous peoples into the Euro-Canadian society (Sect. A.5.4), it is important to control not just the effect of residential schools on the likelihood of pursuing higher learning, but also their intended effects to disconnect and disenfranchise. There are five belonging variables, each of which is structured as a four-point Likert scale: "Disagree or strongly disagree"; "Neither agree nor disagree"; "Agree"; and "Strongly agree." These variables range from openness to learn more about their Indigenous identity to a sense of belonging to their identity group, and to Canada. A principal components analysis conducted on the five variables revealed that "Sense of belonging to community" and "Sense of

belonging to Canada" accounted for most of the variability in the data. The four belonging variables relating to culture are averaged to generate a new variable, "Sense of belonging to culture." Other factors previously shown to affect postgraduation income and decisions to pursue PSE are included as control variables in both Model 2 and 3.

Barriers to university education related to ongoing familial and community obligations are approximated by the variable "Population Density." This is a derived variable allowing the results of those living in urban centres to differ from those living in remote or rural communities where members are often more dependent on one another. Population density consists of two categories described below and is coded as a dummy variable, Urban Centre (1) and Rural Area (0).

Table 4.6: Summary statistics for population density with original values.

Population Density							
Categories	**Frequency**	**Weighted Frequency**	**%**	**Code**	**Frequency**	**Weighted Frequency**	**%**
Other rural	3,930	201,831	20.2	0	6,902	245,863	24.6
Single identity - Inuk (Inuit)	2,972	44,032	4.4				
CMA	8,846	500,000	50.1	1	13,947	752,653	75.4
Other population centre	5,101	252,653	25.3				
Valid skip	0	0	0	.	0	0	0
Don't know	0	0	0				
Refusal	0	0	0				
Not stated	0	0	0				
Total	20,849	998,517	100		20,849	998,517	100

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table 4.7: Summary statistics for new variables in models 2 and 3.

Variable	Categories	Weighted frequency	%
Employment income	Low income (<$30,000 CAD)	276,557	44.5
	High income (≥$30,000 CAD)	345,142	55.5
Highest level of educational attainment	Postsecondary below bachelor	323,807	75.5
	Bach. degree or above	104,609	24.5
Age group of respondents	Between the ages of 15 and 24	222,745	22.3
	Between the ages of 25 and 34	181,294	18.2
	Between the ages of 35 and 44	158,262	15.8
	Between the ages of 45 and 54	187,232	18.8
	Age 55 and over	248,984	24.9
Population density	Rural area	245,863	24.6
	Urban area	752,653	75.4
Postsecondary funding sources	Funded by other parties only	350,913	58.8
	Funded by self and other parties	128,574	21.6
	Self-funded only	116,906	19.6
Reason for program choice: Lot of jobs in this field	No	180,793	41.8
	Yes	251,376	58.2
Personal interest	No	55,963	12.9
	Yes	376,206	87.1
Recommended	No	267,106	61.9
	Yes	165,062	38.1
Good reputation	No	154,467	35.8
	Yes	277,701	64.2
Program length	No	120,053	27.7
	Yes	312,116	72.3
Wanted to help community	No	206,270	47.8
	Yes	225,899	52.2
Other	No	353,523	81.8
	Yes	78,645	18.2
Postsecondary guidance received	Inadequate or very inadequate	137,390	23.2
	Neither adequate nor inadequate	39,371	6.6
	Adequate	317,595	53.5
	Very adequate	98,985	16.7
Sense of belonging to Canada	Disagree or strongly disagree	49,014	5.1
	Neither agree nor disagree	24,941	2.6
	Agree	394,591	41.3
	Strongly agree	486,827	51.0

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

4.5.2 Methodology

As in Chapter 3, all estimates included in this report are produced using StataMP 18 after applying person-level weights in addition to the 681 bootstrap weights and specifications as prescribed in the literature

accompanying the dataset (Vongdara et al., 2018, 2020; Analyzing Survey Data, 2014). Models 2 and 3 are expressed as Logit functions as depicted in Eq. 4.7.

$$logit[P(Y=1|X_1,\dots,X_n)] = \ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_n X_n + \varepsilon \tag{4.7}$$

4.5.2.1 Model 2

Model 2 shown below and described in Eq. 4.7 a hierarchical logistic regression structured to gain a deeper insight into the nature of the relationships between employment income, highest level of education attained and nine additional determinants of employment income. It is designed to help understand the impact of a student's motivation and guidance received for on attained income for postsecondary graduates after controlling for education level and several demographic and socioeconomic factors. Of interest in this model are whether and to what extent respondents' funding sources, access to information, and/or motivations for pursuing their postsecondary program impact the likelihood that they will obtain a higher postgraduation employment income after controlling for education level.

The variables in Model 2 are added in blocks to test if educational disparities can be explained by factors that are specific to postsecondary graduates. These variables include the sources of postsecondary funding, the respondents' reasons for choosing their postsecondary program, and the quality of the guidance they received. The blocks or groups of variables are organized according to the frame of reference described in Sect. 4.2.

Model 2.1 is a variation of Model 1.4 to test if the results from Model 1 are robust when the sample is restricted to postsecondary graduates. The factors included in Model 2.1 therefore mirror those of Model 1.4 (Sect. 3.5). These include the Mincer model variables (age, experience or job tenure, education level), the credentialist variables (occupational skill levels, occupational categories), sex, cultural identity group, and employment status as a control.

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \sum_{i=1}^{8} \beta_i X_i + \varepsilon \tag{4.8}$$

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \sum_{i=1}^{8} \sum_{j=1}^{J_i-1} \beta_{ij} D_{ij} + \varepsilon \tag{4.9}$$

Model 2.2 then adds "Source of postsecondary funding" as an independent variable to provide a basis for comparison and as a proxy for expected return to education. Lack of access to capital or insufficient funding

is widely reported as one of the most significant factors affecting access to PSE for Indigenous students (Sect. 4.2). It also stands to reason that students who self-fund their education should expect to earn a return on their investment in the form of higher wages.

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \sum_{i=1}^{8}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \sum_{k=1}^{2}\beta_{9k}D_{9k} + \varepsilon \tag{4.10}$$

Model 2.3 builds on Model 2.2 by adding several of the preference factors identified in Sect. 4.2 to test if the preference factors are significant determinants of postgraduation employment income after controlling for costs and the information available to students to inform their decisions. Additional factors include respondents' reasons for choosing their postsecondary program in addition to the adequacy of the guidance they received.

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \sum_{i=1}^{9}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \beta_{10}D_{10} + \cdots + \beta_{16}D_{16} + \sum_{k=1}^{3}\beta_{17k}D_{17k} + \varepsilon \tag{4.11}$$

Model 2.4 adds a series of interaction effects between the respondents' cultural identity group and their sources of funding to account for the heterogeneity in returns to education amongst identity groups described in Sect. 2.2.

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right) = \beta_0 + \sum_{i=1}^{17}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \sum_{m=1}^{4}\sum_{n=1}^{2}\beta_{18mn}\,(D_{8m} * D_{9n}) + \varepsilon \tag{4.12}$$

Where:

- Y = Employment income
- β_0 = Intercept or constant
- D_{ik} = A dummy variable for category k of variable X_i
- $\sum_{i=1}^{8}\beta_i X_i$ = Model 1 independent variables
- $\sum_{i=1}^{8}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij}$ = Model 1 independent variables expanded into dummy variables
- X_9 = Sources of funding
- $\beta_{10}D_{10} + \cdots + \beta_{16}D_{16}$ = 7 dummy variables representing reasons for program choice
- X_{17} = Guidance received
- $\sum_{m=1}^{4}\sum_{n=1}^{2}\beta_{18mn}\,(D_{8m} * D_{9n})$ = Interaction effects between identity group (X_8) and funding sources (X_9)

4.5.2.2 Model 3

Model 3 is designed to bridge our understanding of the social and economic determinants of employment income (Model 2) onto decisions to pursue university degrees amongst postsecondary graduates. It explores the relationships between the rates of university attainment and several factors affecting both access to and preferences in pursuing different levels of PSE.

Model 3 presented in Table 4.9 and described in Equations 4.13-4.16 is a hierarchical logistic regression exploring decisions to pursue PSE at or above the bachelor level. All factors are included based on statistical significance found in Models 1 and 2 in addition to factors identified in the literature. Like Models 1 and 2, these variables are added in blocks to test the robustness of the results in the presence of other determinants. These factors include identity group, sources of funding, reason for program choice, guidance received, residential school attendance, and sense of belonging on the decisions of postsecondary graduates to pursue university. Age, sex, identity group, and whether the respondent is living in an urban or rural area are also added as controls.

Model 3.1 includes the respondents' cultural identity group, sources of postsecondary funding, and three control variables: age, sex, and whether the respondent is living in an urban or rural area. Access to capital is regularly cited as one of the main barriers to PSE for Indigenous students. This will determine if those relying on external funding tend to pursue lower levels of education.

$$\ln\left(\frac{P(Z=1)}{1-P(Z=1)}\right) = \beta_0 + \sum_{k=1}^{4}\beta_{2k}D_{2k} + \beta_5 D_5 + \beta_6 D_6 + \sum_{k=1}^{4}\beta_{8k}D_{8k} + \sum_{k=1}^{2}\beta_{9k}D_{9k} + \varepsilon \tag{4.13}$$

Model 3.2 adds a block of motivational factors including seven variables representing their reasons for choosing their postsecondary program, and the quality of the guidance they received.

$$\ln\left(\frac{P(Z=1)}{1-P(Z=1)}\right) = \beta_0 + \sum_{i=1}^{5}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \beta_{10}D_{10} + \cdots + \beta_{16}D_{16} + \sum_{k=1}^{3}\beta_{17k}D_{17k} + \varepsilon \tag{4.14}$$

Model 3.3 adds a block of three variables related to the direct and intergenerational effects of the residential school system on respondents. These variables include if the respondent or a family member attended a residential school as well as two belonging variables representing their sense of belonging to Canada and to their culture.

$$\ln\left(\frac{P(Z=1)}{1-P(Z=1)}\right) = \beta_0 + \sum_{i=1}^{13}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \sum_{k=1}^{3}\beta_{19k}D_{19k} + \beta_{20}X_{20} + \beta_{21}X_{21} + \varepsilon \tag{4.15}$$

Model 3.4 then adds a series of interaction effects between the respondents' cultural identity group and their sources of funding to account for intergroup variability in access to capital and returns to education.

$$\ln\left(\frac{P(Z=1)}{1-P(Z=1)}\right) = \beta_0 + \sum_{i=1}^{16}\sum_{j=1}^{J_i-1}\beta_{ij}D_{ij} + \sum_{m=1}^{4}\sum_{n=1}^{2}\beta_{18mn}\,(D_{8m} * D_{9n}) + \varepsilon \tag{4.16}$$

Where:

- Z = Education level (Table 4.3)
- β_0 = Intercept or constant
- D_{ik} = A dummy variable for category k of variable X_i
- X_{19} = Residential school attendance
- X_{20} = Sense of belonging to culture
- X_{21} = Sense of belonging to Canada

4.6 RESULTS

The results of Models 2 and 3 are presented in Table 4.8 and Table 4.9, respectively, with the goodness-of-fit tests listed at the top of each table. Below the model statistics, the top value in each cell represents the log of the odds of attaining a university degree at or above the bachelor level compared to lower levels of PSE. The value in brackets beneath it represents the standard error of the coefficient. The reliability and significance of each estimate is represented by superscript notation described beneath each table. In the interest of conciseness, unreliable and insignificant interaction effects have been omitted from these tables. Lastly, Tables A.2.3 and A.2.4 in Appendix 2 list the relative risk ratio (rrr), standard error, and the 95% confidence interval. These are the ratios of those who completed a bachelor's degree or above compared to those who completed a lower level of PSE or rather the likelihood that someone in the corresponding group will complete a PSE at or above the bachelor level (McNutt et al., 2003; Zhang & Yu, 1998).

$$RR = \frac{OR}{(1-P_0) + (1 * OR)} \tag{4.17}$$

Where:

- RR = Relative Risk (Ratio)
- OR = Odds Ratio
- P_0 = Baseline risk (probability of the outcome in the reference group)

4.6.1 Model 2 Results: Drivers of Employment Income

Table 4.8: Model 2 – Results and Goodness-of-fit.

	Model 2.1	Model 2.2	Model 2.3	Model 2.4
Number of obs. =	5,108	5,097	5,062	5,053
Population size =	270,643	270,227	268,924	268,457
Replications =	681	681	681	681
Design df =	1,000	1,000	1,000	1,000
F(9, 992) – Adjusted =	1.3600	1.1100	0.7800	0.6200
Prob > F – Adjusted =	0.2001	0.3517	0.6336	0.7793

	Coeff. (Std. err.)	Coeff. (Std. err.)	Coeff. (Std. err.)	Coeff. (Std. err.)
$Y_i = \begin{cases} 0, & if\ income\ <\ \$30{,}000\ \text{CAD} \\ 1, & if\ income\ \geq\ \$30{,}000\ \text{CAD} \end{cases}$	(base outcome)			
Constant	-0.0456 (-0.15)	-0.0966 (-0.32)	-0.102 (-0.28)	-0.0612 (-0.16)
Postsecondary below bachelor level	(base outcome)			
Bach. degree or above	0.450 E** (0.138)	0.437 E** (0.142)	0.525 E*** (0.146)	0.528 E*** (0.148)
Between the ages of 15 and 24	(base outcome)			
Between the ages of 25 and 34	0.516 E*** (0.147)	0.513 E*** (0.147)	0.533 E*** (0.149)	0.529 E*** (0.150)
Between the ages of 35 and 44	1.051*** (0.169)	1.049*** (0.170)	1.061*** (0.170)	1.057*** (0.170)
Between the ages of 45 and 54	1.269*** (0.204)	1.246*** (0.200)	1.249*** (0.204)	1.252*** (0.204)
Age 55 and over	0.633 E*** (0.165)	0.611 E*** (0.164)	0.634 E*** (0.169)	0.642 E*** (0.169)
Began working in 2016 or 2017	(base outcome)			
Began working between 2011 and 2015	0.874*** (0.134)	0.873*** (0.134)	0.876*** (0.135)	0.873*** (0.135)
Began working before 2011	1.553*** (0.151)	1.536*** (0.151)	1.504*** (0.152)	1.501*** (0.153)
Full-time employment	(base outcome)			
Part-time employment	-2.180*** (0.150)	-2.181*** (0.148)	-2.206*** (0.150)	-2.213*** (0.151)
Trades, transport and equipment operators and related…	(base outcome)			
Manufacturing and utilities	0.586 F (0.349)	0.588 F (0.353)	0.529 F (0.351)	0.522 F (0.351)
Natural resources, agriculture and related production...	-0.333 F (0.355)	-0.315 F (0.354)	-0.286 F (0.356)	-0.281 F (0.356)
Sales and service	-0.824 E*** (0.203)	-0.841 E*** (0.203)	-0.802 E*** (0.206)	-0.796 E*** (0.207)
Art, culture, recreation and sport	-1.546 E*** (0.325)	-1.539 E*** (0.326)	-1.465 E*** (0.334)	-1.482 E*** (0.335)
Education, law and social, community and	-0.422 F (0.226)	-0.411 F (0.227)	-0.282 F (0.232)	-0.276 F (0.235)
Health	-0.0521 F (0.251)	-0.0462 F (0.252)	0.0852 F (0.252)	0.0902 F (0.253)
Natural and applied sciences and related	0.379 F (0.287)	0.388 F (0.288)	0.360 F (0.290)	0.358 F (0.290)
Business, finance, and administration occupations	0.216 F (0.216)	0.213 F (0.216)	0.230 F (0.218)	0.235 F (0.219)

Management	-0.442 F (0.334)	-0.458 F (0.329)	-0.434 F (0.327)	-0.425 F (0.328)
D - On-the-job training is provided	(base outcome)			
C - Secondary school and/or job-specific training	-0.0201 F (0.263)	0.000961 F (0.260)	0.0366 F (0.258)	0.0283 F (0.255)
B - College education or apprenticeship training	0.353 F (0.258)	0.345 F (0.257)	0.366 F (0.254)	0.361 F (0.253)
A - University education	0.792 F ** (0.292)	0.788 F** (0.290)	0.827 F** (0.289)	0.814 F** (0.288)
Male	(base outcome)			
Female	-0.686 E*** (0.135)	-0.666 E*** (0.135)	-0.640 E*** (0.138)	-0.644 E*** (0.139)
Single identity - Status First Nations	(base outcome)			
Single identity - Métis	0.0879 F (0.115)	0.0634 F (0.113)	0.0459 F (0.112)	0.00215 F (0.140)
Single identity - Inuk (Inuit)	0.0965 F (0.239)	0.132 F (0.247)	0.125 F (0.239)	0.00351 F (0.186)
Multiple Aboriginal identities	0.298 F (0.421)	0.287 F (0.427)	0.233 F (0.393)	0.208 F (0.505)
Aboriginal responses not included elsewhere	1.819 F** (0.623)	1.749 F** (0.651)	1.623 F* (0.643)	0.0465 F (0.672)
Funded by other parties only	(base outcome)			
Funded by self and other parties		0.113 F (0.130)	0.0871 F (0.133)	-0.0385 F (0.172)
Self-funded only		0.281 F (0.166)	0.313 F (0.165)	0.361 F (0.223)
Reason for program choice: Lot of jobs in this field			0.186 F (0.115)	0.172 F (0.116)
Personal interest			-0.0506 F (0.184)	-0.0490 F (0.186)
Recommended			0.185 F (0.110)	0.185 F (0.111)
Good reputation			-0.127 F (0.161)	-0.118 F (0.161)
Program length			0.282 F (0.178)	0.275 F (0.179)
Wanted to help community			-0.423 E*** (0.127)	-0.420 E** (0.128)
Other			0.0827 F (0.129)	0.0860 F (0.130)
Postsecondary guidance received			-0.0499 F (0.0557)	-0.0513 F (0.0558)
Inuk (Inuit) # Self-funded only				1.214 F* (0.576)

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)
*Standard errors in parentheses: * = p < 0.05, ** = p < 0.01, *** = p < 0.001*
Acceptability of sampling error variability: E = use with caution, F = unreliable

Model 2 is focused on understanding the relationship between motivation for pursuing a postsecondary program, the adequacy of the guidance they received, and postsecondary funding sources on employment income. This test serves a link the population estimates provided in Model 1 to Models 2 and 3 which are restricted to postsecondary graduates. As such, the variables in Model 2.1 are identical to those of Model 1.4 and the results are consistent with expectations.

All sector and industry agnostic factors such as job tenure, sex, and identity group largely mirror those of Model 1.4 in both significance, reliability, and magnitude. University education at or above the bachelor level has a positive and significant relationship with employment income though the magnitude is reduced since the base outcome in the Model 2.1 is a higher level of education. Age is also found to be a significant determinant of employment income amongst postsecondary graduates and follows a similar concave pattern to that shown in Table 3.4. The magnitude of these effects increases with age, peaking between the ages of 45 and 54. Beyond this, the magnitude of the effect decreases slightly and results become more variable. This is consistent with the population estimates from Model 1.4. The effect of industry on employment income in Model 2.1 also mirrors that in Model 1.4 apart from sales and service workers which show a decrease in the reliability of the estimate, and management which is no longer significant amongst postsecondary graduates.

Models 2.2-2.4 add groups of variables that have been shown to influence decisions to pursue PSE. With one exception, none of the additional factors are found to significantly affect the likelihood that the postsecondary graduate will earn more than $30,000 per year in employment income nor do they have any notable effects on the significance, reliability or magnitude of the estimates from Models 2.1 or 1.4. This is not surprising since the factors were drawn from the literature exploring determinants of educational attainment, not employment income. Despite this they serve to tie the results from Model 2 to Model 3 and provide additional insights into the relationships between access and preference factors, and financial incentives as motivators.

A number of the variables added in these models relate to reasons why respondents chose their postsecondary program as well as the adequacy of guidance received. The only reason found to be a statistically significant determinant of employment income is “Wanting to help community” which is negatively related to postgraduation employment income. According to the relative odds listed in Table A.2.3, those who identified wanting to help their home community as a reason for choosing their postsecondary program are ≈34% less likely to earn more than $30,000 in employment income after graduation. The lack of significance of these factors, particularly the reasons for their choice of programs, provides further evidence against the proposition that decisions to pursue postsecondary programs are driven by financial incentives.

4.6.2 Model 3 Results: Drivers of University Attainment

Table 4.9: Model 3 – Results and Goodness-of-fit.

	Model 3.1	Model 3.2	Model 3.3	Model 3.4
Number of observations =	8309	8,222	6,128	6,128
Population size =	425,769	422,105	308,146	308,146
Replications =	681	681	681	681
Design df =	1000	1,000	1,000	1,000
F(9, 992) – Adjusted =	1.75	0.33	0.71	0.61
Prob > F – Adjusted =	0.0736	0.9637	0.7046	0.7893

	Coeff. (Std. err.)	Coeff. (Std. err.)	Coeff. (Std. err.)	Coeff. (Std. err.)
$Y_i = \begin{cases} 0, & if\ Education < \text{Bach. Degree} \\ 1, & if\ Education \geq \text{Bach. Degree} \end{cases}$	(base outcome)			
Constant	-2.472*** (0.135)	-2.919*** (0.222)	-2.488*** (0.320)	-2.445*** (0.326)
Between the ages of 15 and 24	(base outcome)			
Between the ages of 25 and 34	0.602 E*** (0.119)	0.609 E*** (0.124)	0.655 E*** (0.152)	0.660 E*** (0.152)
Between the ages of 35 and 44	0.554 E*** (0.124)	0.606 E*** (0.130)	0.682 E*** (0.154)	0.692 E*** (0.154)
Between the ages of 45 and 54	0.232 F* (0.112)	0.323 F** (0.117)	0.401 F** (0.142)	0.410 F** (0.143)
Age 55 and over	0.328 E*** (0.0981)	0.407 E*** (0.103)	0.430 E*** (0.133)	0.436 E*** (0.133)
Male	(base outcome)			
Female	0.306 E*** (0.0723)	0.196 F** (0.0758)	0.193 F* (0.0903)	0.191 F* (0.091)
Residence – Rural Area	(base outcome)			
Urban Centre	0.533 E*** (0.0934)	0.538 E*** (0.0938)	0.635 E*** (0.107)	0.638 E*** (0.108)
Single identity - Status First Nations	(base outcome)			
Single identity - Métis	-0.0338 F (0.0725)	-0.0211 F (0.0726)	-0.130 F (0.0875)	-0.185 F (0.129)
Single identity - Inuk (Inuit)	-0.106 F (0.155)	-0.149 F (0.161)	-0.153 F (0.170)	-0.386 F (0.207)
Multiple Aboriginal identities	-0.292 F (0.328)	-0.228 F (0.316)	-0.554 F (0.373)	-1.027 F (0.540)
Aboriginal responses not included elsewhere	0.818 F (0.561)	0.808 F (0.628)	0.837 F (0.692)	0.376 F (1.180)
Funded by other parties only	(base outcome)			
Funded by self and other parties	1.195 *** (0.0809)	1.164 *** (0.0833)	1.107 *** (0.0954)	1.043 *** (0.139)
Self-funded only	0.139 F (0.0986)	0.116 F (0.103)	-0.0233 F (0.115)	-0.148 F (0.193)
Reason for program choice: Lot of jobs in this field		-0.569 *** (0.0798)	-0.570 *** (0.0898)	-0.576 *** (0.0898)

Personal interest		0.925 ***	0.930 E***	0.931 E***
		(0.153)	(0.176)	(0.178)
Recommended		0.0786 F	0.127 F	0.128 F
		(0.0764)	(0.0868)	(0.0873)
Good reputation		0.293 F**	0.298 F*	0.301 F*
		(0.103)	(0.126)	(0.126)
Program length		-0.810 ***	-0.871 ***	-0.870 ***
		(0.102)	(0.122)	(0.123)
Wanted to help community		0.794 ***	0.890 ***	0.888 ***
		(0.0840)	(0.0942)	(0.0943)
Other		-0.0670 F	0.0256 F	0.0231 F
		(0.0952)	(0.108)	(0.109)
Postsecondary guidance received		-0.0538 F	-0.0519 F	-0.0533 F
		(0.0377)	(0.0429)	(0.043)
Neither respondent nor family attended	(base outcome)			
Parent(s) / grandparent(s) / other family attended			-0.459 E***	-0.468 E***
			(0.105)	(0.106)
Only parent(s) or grandparent(s) attended			-0.757 E***	-0.766 E***
			(0.146)	(0.147)
Respondent attended			-0.914 E***	-0.929 E***
			(0.201)	(0.205)
Sense of belonging - Indigenous community			0.125 F*	0.122 F*
			(0.0605)	(0.0608)
Sense of belonging - Canada			-0.141 F**	-0.144 F**
			(0.0505)	(0.0508)
Inuk (Inuit) # Funded by self and other parties				1.181 E***
				(0.361)

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)
*Standard errors in parentheses: * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$*
Acceptability of sampling error variability: E = use with caution, F = unreliable

4.7 Post Estimation Analysis and Discussion

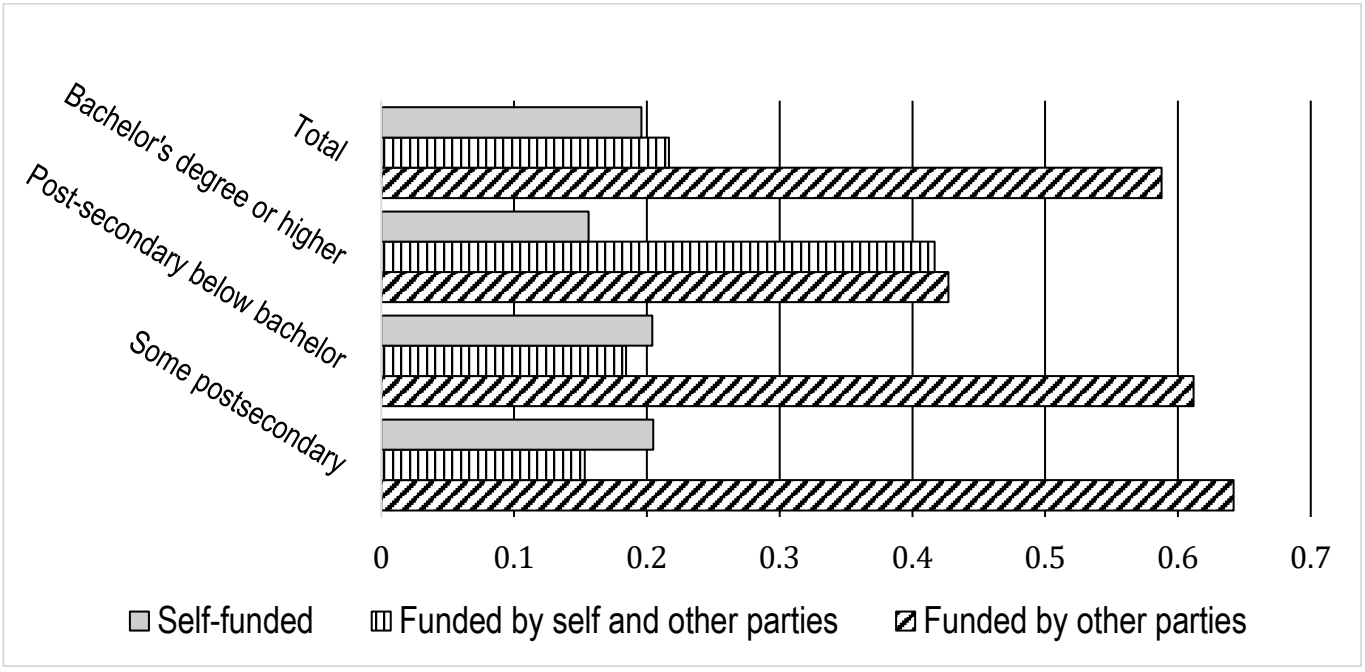
The purpose of this study is to better understand why Indigenous peoples tend to pursue lower levels of PSE when the earnings premiums are so much higher for those who complete university degrees. Table 4.9 lists the impact of sense of belonging, residential school attendance, guidance received, sources of funding and reasons for program choice on the decisions of postsecondary graduates to pursue university after controlling for factors previously shown to influence these decisions. In this section I discuss these results with a focus on the more significant and influential determinants of university attainment, sources of funding, reasons for program choice, residential school attendance, and sense of belonging.

4.7.1 Funding Sources on Education and Income

While many Indigenous peoples have treaty rights to education in Canada, insufficient funding is widely reported as one of the most significant barriers affecting access to PSE (Deonandan et al., 2019; Pidgeon et al., 2014). These findings show that sources of funding are among the most significant determinants of university education amongst postsecondary graduates. Almost two thirds (59%) of postsecondary graduates rely solely on funds from other parties to pay for their education. These individuals are 2.8 times less likely to complete a university education at or above the bachelor level than those who used a mix of their own funds and funds from other sources (Table A.2.3) and 1.44 times less likely to earn more than $30,000 in postgraduation employment income than those who self-fund their PSE (Table A.2.4).

Two crosstabulations presented in Table A.2.1 and A.2.2 cross-reference sources of funding against education levels amongst postsecondary graduates. Fig. 4.1 is drawn from Table A.2.1 and depicts the levels of PSE as a percentage of the total for each education level across different sources of funding. It shows that the percentages of those who have not completed their postsecondary program and those who complete a postsecondary program below the bachelor level are roughly consistent across the categories of funding sources, while those who complete a bachelor's degree or above more often rely on the use of personal funds.

Figure 4.1: Funding sources by education level amongst postsecondary graduates.

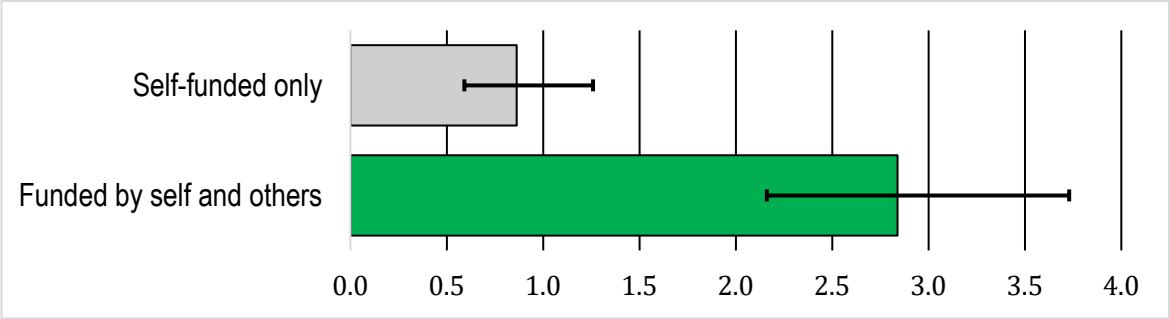


Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

4.7.1.1 Government Funding Programs

Fig. 4.2 shows the likelihood of obtaining a university degree based on sources of funding. The figure clearly indicates that those who use a mix of their own funds and funds from other sources are significantly more likely to pursue higher levels of education than those who rely entirely on funds from other parties. This raises an important question regarding the adequacy of the GoC's funding programs and policies, which may be amplifying and perpetuating the gap in rates of university attainment. It is not apparent why those who pay for their education using funds from other parties tend to pursue lower levels of PSE that are less expensive, shorter in duration, and result in disproportionately smaller earnings premiums than those who use their own funds, either in whole or in part. It is possible that the funding they receive from other sources is only enough to cover the costs of lower levels of PSE and that the only ones who can pursue higher levels of PSE are those who have and are willing to use their own funds to cover the difference. It is also possible that the restrictions placed on funding are acting as a deterrent to pursuing PSE. This is also evidenced in the proportion of Inuit and Status First Nations peoples who have obtained a postsecondary credential compared to the identity groups without treaty rights to education as shown in Table 2.2. Lastly, the lower levels of education that funded Indigenous students tend to pursue are not only less expensive and shorter in duration, but they are also more often located closer to reserves where students are more likely to have the option to maintain connection to their territories and support systems while they complete their studies.

Figure 4.2: Relative likelihood of obtaining a university degree by funding source.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)
The base outcome is "Funded entirely by other parties."

4.7.1.2 Decision to Wait

PSE in Canada is expensive, and few students can afford it without financial assistance. Approximately 60% of postsecondary students graduate receive student loans in Canada with undergraduate students owing an average of $28,000 when they graduate (Statistics Canada, 2026). The Canada Student Financial Assistance Program is designed to provide sufficient access to capital for all qualifying students and in most

cases provides sufficient funding to cover tuition and basic needs in the cities where universities are located (Sect. 4.2.3). While these loans are equally available to Indigenous students, the availability of government funding and treaty rights adds a layer of complexity to these students' decisions. These programs are notoriously underfunded and with some bands having to turning away more than twice as many qualified applicants (Monkman, 2016). Those who are turned away must decide whether to pay the costs from savings or by incurring debt or wait until the next funding cycle to reapply. Assuming that they would not be reimbursed for the personal funds they used to begin their program earlier, there would be an incentive for students to delay their PSE. The hope or expectation that they would be approved for funding the following year creates a pay-out structure that drives decisions towards waiting. In other words, if the perceived likelihood that they would obtain funding in the future is high enough, the dominant strategy would be to work until they are able to reapply.

Where the decision to delay a postsecondary program becomes especially problematic with the funding systems that bands have been forced to implement (see Sect. 4.2). These systems often prioritize newly graduated high school students followed by those continuing their postsecondary program and finally returning students (Monkman, 2016). Due to their lower priority status as a returning student, prospective postsecondary students who choose to delay their program would then be presented with the same situation in the following funding cycle only with a decreased probability of being approved.

Possibly further motivating unfunded students to delay their PSE is the concept of loss aversion. Previous studies have shown that people tend to weight losses more heavily than equivalent gains so any personal funds used, or debt incurred by unfunded students would likely be considered a loss and disproportionately offset their expected postgraduation earnings (Binswanger, 1981; Hardie et al., 1993; Wakker, 2010).

Lastly, Indigenous peoples have a right to education and should not have to pay for it by incurring debt or using personal funds. It is understandable that many of these students feel cheated by having to pay for something that they are entitled to. Having already sacrificed so much for these rights, it is possible that students would sooner choose a less desirable option to avoid feeling cheated or as though they are being further taken advantage of. In essence, the government's failure to honour its treaty obligations in full may be perpetuating educational disparities by incentivising prospective students to delay their studies.

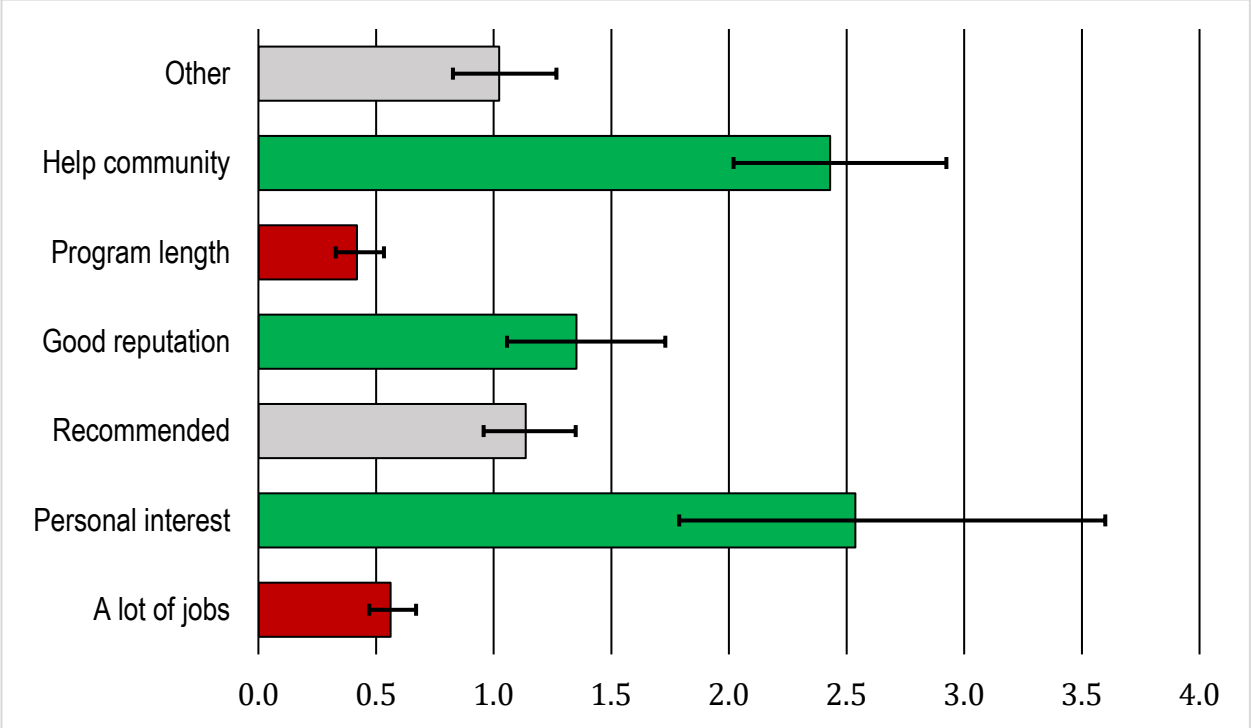
4.7.2 Reasons and Guidance on Education and Income

4.7.2.1 Reasons for Program Choice

With the exception of "Recommended" and "Other" (which includes money), Model 3 results suggest that all reasons for postsecondary program choice are significant predictors of the likelihood that Indigenous students will obtain a university degree. Fig. 4.3 is a postestimation plot drawn from the results of Model 3.4 after controlling for all other covariates and expressed as relative risk ratios drawn from Table A.2.4. It shows the relative likelihood that respondents who answered yes to a reason would earn a university degree than someone who answered no. The magnitude of the bars represents the relative risk, and the vertical bars represent the 95% confidence intervals. The coloured bars represent reliable and significant variables with green indicating an increase in the likelihood and red a decrease. This indicates that their reasons for choosing their program matter when it comes to the level of education they will go on to complete.

Notably, personal interest, good reputation and wanting to help community all positively affect the likelihood, while the program length and number of jobs in the field negatively affect the likelihood. This is surprising considering that all but one of the reasons for postsecondary program choice is not significantly related to postgraduation income. The motivations for pursuing different levels of PSE are therefore useful in determining whether respondents will obtain a higher level of education, but not whether they will earn more money after graduating. Had these reasons been driven by postgraduation income, they should have shown greater significance in Models 2. More specifically, those whose reason for choosing their program is either because of the length of the program or that there are a lot of jobs in the field are 58% and 44% less likely, respectively, to pursue university. Those whose reasons are grounded in personal interest, the reputation of the program or their desire to help the community are 2.5, 1.4 and 2.4 times more likely to complete at least a bachelor's degree.

Figure 4.3: Reasons for program choice on the likelihood of university completion.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

The two strongest motivations for completing a university education at or above the bachelor level are those who chose their program because of personal interest and/or because they wanted to help their community. These individuals are roughly two and a half times more likely to pursue a university degree and four to six times more likely than those who chose their program because there are a lot of jobs in the field and/or the program length. Notably, these are the only two of the six reasons in this survey that are intrinsic in nature and that do not impact the net present value of PSE. Contrary to what we would expect under HCT, those who identified "Wanted to help community" as a reason for choosing their program are 34.3% less likely to earn more than $30,000 in employment income. In other words, the second strongest motivator for pursuing a higher level of education and the only motivator that is a statistically significant determinant of postgraduation income has a negative effect on income. One possible explanation for this could be in how wealth or value is obtained and experienced in Indigenous communities. As explained in Sect. 3.2.1, Indigenous peoples often treat the strength of their relationships as a form of wealth. This was, in fact, a defining feature of the Indigenous economy as explained by Carol-Anne Hilton (Hilton, 2021; Loo, 1992).

In fact, the two reasons that directly relate to postgraduation income, the program length and number of jobs in the field, both negatively affect the likelihood that students will pursue a university degree. Importantly, the former is related to future employment prospects, while the latter impacts the actual and opportunity cost of the program. All else equal, both factors would increase the NPV of PSE, yet they are found to decrease the likelihood that students will complete levels of education that have the highest

earnings premiums. It could be also argued that choosing a program because it has a good reputation would also indirectly increase postgraduation employability and income, yet none of these reasons are found to affect the likelihood of earning higher incomes once education level is controlled for.

Notwithstanding "Recommended" and "Other," Model 3 suggests that all reasons for postsecondary program choice are significant predictors of the likelihood of obtaining a bachelor's degree or above, yet only one of the reasons is significantly related to postgraduation income. The reasons for pursuing a postsecondary program are therefore useful in determining whether respondents will obtain a higher level of education, but not whether they will earn more money after graduating. Had these reasons been financially motivated or closely tied to postgraduation income, they should have shown greater significance in Model 2. Instead, the only statistically significant reason for program choice that affects the likelihood of earning higher incomes is altruistic in nature and negatively related to postgraduation income.

4.7.2.2 Source of Motivation

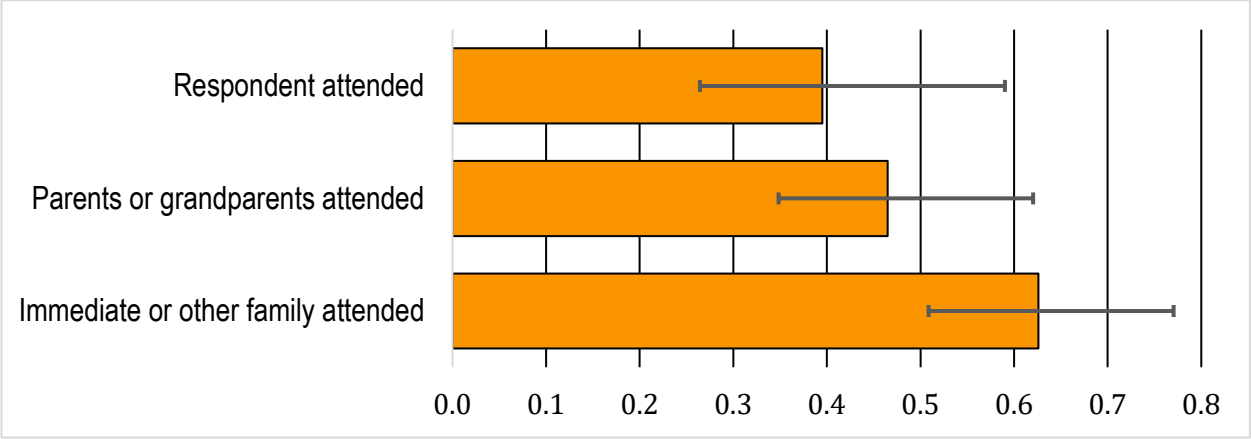
Another interesting finding is that all statistically significant reasons for program choice affecting the likelihood that these postsecondary graduates will pursue different levels of education pertain to personal or internal motivations and reasoning. Whether it be wanting to help their community, the reputation of the school, personal interest, the length of the program, or the availability of jobs in the field, students appear to be self-directed and driven by their own deliberations and rationalizations. Advice from others, such as the adequacy of the guidance received and choosing a postsecondary program because it was recommended, are neither found to influence decisions to pursue a particular level of PSE nor the likelihood of earning a higher postgraduation employment income. This is intriguing though not unprecedented. Verde (2009) finds that Indigenous students seek education as a means to self-growth and to increase their autonomy by developing competencies that enable greater self-reliance, and ability to positively impact their communities (Verde, 2019). Students also often see their education as a means to achieve self-actualization through self-understanding and personal wellbeing—both of which are central to knowledge development in many Indigenous cultures.

4.7.3 Residential Schools and Sense of Belonging

The results presented in this paper are consistent with findings that those subjected to this system would be less likely to pursue higher levels of education (Feir, 2016). Overall, the effects of this system on rates of university attainment are significant in not just the survivors, but also their immediate and extended family. Fig. 4.4 is a postestimation plot drawn from Model 3 results after controlling for all covariates and interpreted as relative risk ratios as seen in Table A.2.4. It shows the likelihood that postsecondary graduates

who attended residential schools or have family members who attended would earn a university degree relative to someone with no direct or familial connection to residential schools. The magnitude of the bars represents the relative risk, and the lines represent the 95% confidence intervals.

Figure 4.4: Residential school attendance on the likelihood of obtaining a degree.



Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Fig. 4.4 indicates that the effect of the RSS on rates of university attainment is most pronounced in residential school survivors, and the magnitude of this effect decreases relative to the proximity of the respondent to the family member who attended. Residential school survivors who go on to complete a PSE are also 60% less likely to complete a university education at or above the bachelor level than someone with no direct or familial connection to residential schools. Those with parents or grandparents who attended and those with extended family who attended are 54% and 37% less likely, respectively. These findings support the existence of intergenerational trauma often reported in the literature and in personal accounts of those directly and indirectly affected by the RSS (Grady, 2023; *RCAP*, 1996b). This is consistent with hypothesis H.3.3.1 as well as Sect. A.5.4 explaining that the purpose of this system was not to educate, but rather to assimilate.

The two sense of belonging variables included are both found to be statistically significant predictors of educational attainment in Model 3.4 though both are considered unreliable due to the observed variability in sampling error. These findings show that the nature, magnitude and significance of this effect is opposite to hypotheses H.3.3.2 and H.3.3.3. More specifically, postsecondary graduates who feel a stronger sense of belonging to Canada are also less likely to complete a higher level of PSE. In other words, both the act of subjecting an individual to the RSS and the intended effect of this system result in lower levels of education. This has important implications though the unreliability of the results in the belonging variables prevent us from establishing concrete implications.

This increased variability in sampling error is not surprising considering the approach used to measure complex and nuanced constructs such as that of the relationship between Indigenous people and Canada. Best practices in the social sciences literature often rely on instruments containing dozens of Likert-style questions to capture sense of belonging in different, less nuanced, contexts. For example, the Sense of Social Fit scale uses 17 Likert-style questions to measure sense of belonging to a particular group (Walton et al., 2012). Another instrument designed for use in postsecondary environments uses a 26-items questionnaire to capture five dimensions of belonging (Hoffman et al., 2002). While many studies include only a few questions, they provide only a limited understanding of inherently complex structures often consisting of multiple interdependent dimensions (Knekta et al., 2020).

4.7.4 Other Determinants of Education Level

Age has a consistently positive statistically significant relationship with education level which starts to plateau above the age of 45. This is consistent with previous studies which find that Indigenous students tend to pursue university degrees later than the general population (By the Numbers, 2024). It is also well aligned with many of the barriers faced by these students such as tracking to trade schools and colleges which often prevent direct entry into university. Notably, however, these results are subject to significant variability in sampling error and should be used with caution. Future studies focusing on age as a determinant of educational attainment should consider generational factors influencing the accessibility and demand for university degrees including the number of universities in Canada, the availability of capital, bridging programs, community partnerships, and the proportion of jobs requiring university degrees.

Those living in rural communities are significantly less likely to go on to earn a bachelor's degree or above. They are also those most likely to have grown up in underfunded federal educational systems and most likely to be members of the two identity groups identified in Sect. 2.2 as having consistently lower levels of education despite having the highest returns to education.

Sex is also found to significantly reduce the likelihood of respondents earning more than $30,000 annually in employment income. This result is robust with respect to significance, reliability and magnitude both within the population, the subsample, the literature (Sect. 3.4), as well as across identity groups. Females were, however, found to be 1.2 times more likely to pursue university degrees at or above the bachelor level than their male counterparts. While higher education levels will likely increase the average earnings of Indigenous females, the gender pay gap is notably smaller in the Indigenous population than in the general population (Preston, 2008; D. Wilson & Macdonald, 2010).

4.8 Conclusion

The current understanding of why people pursue PSE proposed in the labour economics literature is not consistent with pervasive and enduring discrepancies in rates of educational attainment for the Indigenous population in Canada. This is evidenced not only in the existence of the gap in rates of university attainment, but also in the choices of postsecondary programs amongst those with different sources of funding.

The results presented in this chapter provide little evidence to support the proposition that Indigenous students pursue PSE primarily for financial gain as proposed by Human Capital Theory, Signalling Theory and other theories grounded in assumptions of money-maximizing rational actors. Instead, Indigenous students tend to be more driven to choose educational paths that align more closely with their culture and values, often at the expense of future earnings. More specifically, the primary motivators for pursuing university education are either unrelated or negatively related to postgraduation income.

Notably, the two strongest motivators to pursue university degrees, personal interest and wanting to help their community, are the only two of the six reasons for postsecondary program choice in the 2017 APS that do not impact the net present value of PSE as described in Sect. 3.2.3. Additionally, those pursuing a PSE because they want to help their community are over twice as likely to complete a bachelor's degree or above and significantly less likely to earn a higher postgraduation income. In fact, all statistically significant reasons for program choice that affect the likelihood that Indigenous postsecondary graduates will pursue a university degree relate to personal or internal motivations and reasoning. In this respect, students are more often self-directed and driven by their own deliberations and rationalizations.

Sources of funding are also found to significantly affect the likelihood that these students will complete a university degree. Most graduates rely solely on funds from other parties to pay for their education, however, these individuals are 2.8 times less likely to earn a university than those who use a mix of their own funds and funds from other sources and 1.44 times less likely than those who self-fund their PSE to earn a higher income after graduating.

These findings provide strong evidence of the negative relationship between higher education and residential school attendance amongst survivors and their descendants. The magnitude and significance of this relationship increase with the proximity of the respondent to the residential school survivor which provides evidence for the intergenerational trauma that continues to plague these communities. Lastly, these findings also raise concerns over the government funding programs which may be amplifying and perpetuating the gap in university attainment rates by either incentivizing students to delay their studies or by restricting the options available to them.

4.9 Limitations and Future Work

4.9.1 Limitations

Many of the limitations in the current research and findings relate to the database used which were outlined in Chapter 3. For more information on these limitations, readers are referred to Sect. 3.9. The literature suggests that Indigenous students struggle with low self-esteem, self-efficacy and sense of belonging in university spaces. These are widely regarded as significant factors influencing decisions to pursue higher levels of education though, as explained in Sect. 4.7, the 2017 APS is not suitable to understand the nature of these effects nor validate their significance. These and other factors are explored in greater detail in the following chapter.

4.9.2 Future Work

Funding sources and the failure of the GoC to honour its treaty negotiations in full may be incentivising Indigenous students to delay their postsecondary studies and restricting the options available to them. Further research is warranted to investigate the effects of funding restrictions and priority systems affect the likelihood that Indigenous students will pursue different levels of PSE. It is unclear if the significance of funding sources on university completion is the result of the inaccessibility of capital or behavioural factors relating to mental accounting, perceived returns or injustice. More work also needs to be done to understand the intergenerational effect of the RSS and its relationship to many of the contemporary issues faced by Indigenous Nations and communities. Lastly, it is important to unpack the reasons driving Indigenous students to pursue university programs and their implications on initiatives seeking to increase Indigenous student engagement in university. Despite the comprehensiveness of the 2017 APS and quality of the data, it is limited in its ability to capture the nuances of these decisions and thought processes. Future work should seek to better understand the lived experiences of Indigenous students in university using methodologies that better align with Indigenous relational approaches and traditions of storytelling.

5 UNDERSTANDING THE LIVED EXPERIENCES OF INDIGENOUS STUDENTS IN CANADIAN UNIVERSITIES.

Earning a university degree is a major life accomplishment requiring a significant investment of time, money, and energy. For many, it's a journey that builds character, tests resolve, uncovers hidden qualities, inspires curiosity, presents new ideas and exciting opportunities, and reveals paths in life that they might not have fully considered or felt was available to them. Many believe that students choose this path to acquire the knowledge, skills, and qualifications necessary to equip them for their future careers (Mincer, 1974b). Others believe that it's where students go to showcase their talents to prospective employers and prove to them that they are deserving of higher paying positions (A. Clark, 2000). Importantly, it is also often where young adults first establish their independence and develop an understanding of who they are, what they want to do for a living, and who they strive to be as working professionals. Along the way students become more self-aware by deepening their understanding of themselves—their character, motives, desires, values, beliefs, and perspectives (Yair, 2008). This awareness is essential in realizing their unique potential and contributing to the world in a meaningful way. It allows them to navigate the complexities of life and the ever-evolving societal and professional landscapes with clarity and purpose (Collins & Porras, 1996), and equips them to make more informed decisions, set achievable goals, and pursue careers that align with their true selves (Damon, 2009).

5.1 INTRODUCTION

Chapter 3 presents leading theories from the labour economics literature and shows how these theories alone are unable to account for such pervasive and enduring discrepancies in rates of educational attainment amongst Indigenous peoples in Canada. The foundational assumption upon which these theories are built—that prospective students are money-maximizing agents who base educational decisions on lifetime earnings trajectories—presents an empirical inconsistency when applied to the Indigenous population who have among the lowest graduation rates in the postsecondary programs providing the highest earnings premiums. If treated as an investment or from an earning perspective, Indigenous peoples would have disproportionately higher rates of education. This is also true within the Indigenous population when considering the differences in rates of education and earnings premiums amongst the four identity groups recognized by the GoC (Sect. 2.2). Again, it is the groups with the highest returns to education which have the lowest levels of education. This is especially pronounced in university degrees amongst Inuit and Status First Nations postsecondary graduates. When testing these theories against the Indigenous population in Canada, results indicate that the cornerstone determinants of employment income produce similar estimates

and follow a similar pattern to that of the general population. They are also found to be among the strongest predictors of employment income which implies that educational disparities are not attributable to differences in labour market outcomes. Assuming financial incentives are the primary driver, the scale, pervasiveness and consistency of these disparities across geographic regions, identity groups and time cannot be easily reconciled by contextual factors alone.

Chapter 4 examines this inconsistency more closely by restricting the sample to Indigenous postsecondary graduates (Model 2). Additional factors drawn from the literature were added in blocks to explore the alternative explanations for the empirical inconsistency in education levels and earnings (Sect. 4.6). Subsequently, Model 3 establishes several determinants of obtaining a university degree at or above the bachelor level amongst postsecondary graduates where this inconsistency is most pronounced. This test includes the cornerstone determinants of employment income described in Sect. 3.6 alongside factors known to affect access to and preferences in pursuing PSE (Sect. 4.6.1) and culture-specific factors (Sect. 4.6.3). The results of these tests provide further evidence against the proposition that these students base their decisions to pursue different levels of PSE on financial incentives and identify several non-financial factors better able to account for Indigenous engagement in university programs.

The present study seeks to provide a more nuanced understanding of factors found to significantly affect decisions to pursue university education amongst Indigenous postsecondary graduates. These include access to capital and sources of funding, reasons for program choice, guidance received, residential school attendance, and sense of belonging. Together with our industry partner, Indigenous Works, we conducted a series of semi-structured sharing circles and individual interviews with Indigenous postsecondary students from across Canada. Participants were selected through targeted recruitment campaigns which matched our sample to a graduate student profile constructed from the 2017 APS. This helps to connect themes in the qualitative data to the determinants of Indigenous student attainment of university degrees identified in Model 3.

The questions in this study were developed with the goal of unpacking and dissecting the most influential and significant factors influencing students' educational journeys from previous tests. A directed content analysis of student responses then revealed a number of important findings which help to explain the significance of these factors and ground the quantitative results in a descriptive understanding of the lived experiences of Indigenous students pursuing university programs in Canada. These findings are then mapped onto the frame of reference presented in Sect. 4.3 to further contextualize these findings and derive additional insights into the relative significance of factors affecting access to university education and those affecting preferences in pursuing them.

Findings indicate that access to funding, lack of support, family and community obligations, the availability of information, and being disconnected from their lands and support systems are ongoing issues preventing access to higher education. Students often also don't feel safe or belonging in academic institutions. Negative perceptions of university develop throughout their formative years and are reinforced by experiences of racism on campus. A major theme throughout the data relates to self-efficacy and students having to overcome the feeling that they are not good enough. Many positive factors centre around a sense of duty to dismantle exclusionary systems and pave a path for future generations. Students often reference culture, advocacy and cultivating community as enablers as well as Indigenous cultural resurgence and language revitalization as key motivators. Lastly, students expressed the value of Indigenous role models within the institution as well as non-Indigenous allies. In almost all cases, these supports are described as having been instrumental in their successful completion of their program.

5.2 Questions, Hypotheses and Expected Results

A guiding principle for this research is our commitment to honour Indigenous ways of knowing and being. As researchers, we are accountable to the relationships formed throughout this project, to the stories shared with us, the knowledge systems guiding this research and to all who are directly or indirectly impacted by this work. This research is shaped by Indigenous worldviews, cultural traditions, and rooted in the relationality of knowledge (S. Wilson, 2001).

5.2.1 Access to Capital and Funding Sources

Sect. 4.2.3 and 4.5.2 describe access to capital and financial barriers as one of the most significant and enduring challenges facing prospective postsecondary students. These and other access factors consistent with money-maximizing behaviour are explored in Sect. 5.5.1.

Q.5.1: Why does access to capital and funding sources continue to have such a profound impact on rates of educational attainment?

Q.5.1.1: How do GoC funding programs affect access to PSE?

Q.5.1.2: How does the underfunding of on-reserve schools and/or tacking to trade schools and colleges impact educational and career trajectories?

H.5.1: Most participants in our sample will identify financial constraints as a barrier that they are either currently experiencing or have had to overcome in the past.

H.5.1.1: Participants will express their frustration or dissatisfaction with the GoC's funding programs and its failure to honour its treaty obligations. This frustration will be related to a decreased willingness to pay, increased price sensitivity and aversion to debt in relation to tuition costs (Sect. 4.2.3).

H.5.1.2: Participants educated on reserve or in an Indigenous community will talk about how their educational pursuits were delayed, derailed or made more difficult due to an underfunding of education in their communities—lack of co-curriculars, availability of university pre-requisites, and lack of qualified teachers (Sect. 4.2.1).

5.2.2 Reasons, Motivations and Guidance

The results of Models 1, 2 and 3 indicate that we cannot rely on financial incentives as the primary motivator driving Indigenous students' decisions to pursue university programs in Canada. Instead, factors positively related to the NPV of PSE are found to have a negative effect on decisions to pursue university (Sect. 4.6.2), and those whose reasons are grounded in personal interest or a desire to help their community are more than twice as likely to pursue a university degree (Sect. 4.7.2). Other studies report similar findings and suggest that Indigenous students tend to pursue PSE as a means for personal growth, self-determination or to dismantle systems of exclusion and subjugation (Pidgeon et al., 2014; Verde, 2019).

Q.5.2: How do students describe the reasons and motivations driving their decisions to pursue a university education?

Q.5.2.1: How do financial incentives factor into decisions to go to university?

Q.5.2.2: Why is wanting to help their home community a driving factor in decisions to go to university?

Q.5.2.3: Why doesn't guidance and advice from others influence decisions to go to university?

H.5.2: Participants will not identify financial incentives or factors that serve mainly to increase the return to PSE as primary motivators driving these decisions.

H.5.2.1: Almost all participants will convey that their desire to help their home community or the broader Indigenous community was a primary driver of their decision to pursue a university degree.

H.5.2.2: Participants will describe how their research and academic pursuits align with the goals of their communities.

H.5.2.3: Participants will express how their decisions are internally motivated and based on personal goals around growth and autonomy.

5.2.3 Residential Schools and Sense of Belonging

Previous findings presented in Sect. 4.5.3 suggest that residential school survivors and their families are less likely to complete a university degree and the magnitude of this effect is relative to their proximity to the survivor.

Q.5.3: How do Indigenous students interpret and explain the significance of Canada's RSS on rates of university attainment?

Q.5.3.1: How are the impacts of the RSS affecting their perception of the education system in Canada or Canadian universities?

Q.5.3.2: In what ways have the RSS affected them personally?

Q.5.3.3: How has it impacted their identity and connection to culture and community?

Q.5.3.4: What are some of the more impactful or significant moments throughout their educational journey and how did it help or hinder their successful completion? How do they experience belonging, validation or acceptance in academic settings?

H.5.3- ***H.5.3.1***: The use of the RSS to assimilate Indigenous peoples has negatively affected participants' perceptions of the educational system and resulted in a general distrust of public institutions.

H.5.3.2: Participants who attended residential schools and those with family who attended will share stories of having to overcome trauma through personal healing.

H.5.3.3: Participants will share stories of disconnection from culture and community and loss of Indigenous identity.

H.5.3.4(a): Participants will describe experiencing various forms of racism; being made to feel different or inferior; universities as foreign, unwelcoming and unaccepting of Indigenous ways of knowing, being and doing.

H.5.3.4(b): Some participants will describe negative experiences as motivation to break down barriers and pave a path for others to follow.

H.5.3.4(c): Participants will identify experiences of racism, exclusion and the legacies of colonialism as negatively affecting their sense of self-esteem or self-efficacy.

5.3 Data and Methodology

The data used in this study was collected in partnership with Toronto Metropolitan University (TMU), the University of Regina, and Indigenous Works Inc.—a Saskatchewan-based non-profit whose mission is to increase Indigenous engagement in the Canadian economy. Together we raised a total of $94,000 including $25,000 from the Social Sciences and Humanities Research Council, a $60,000 Mitacs Accelerate grant

and $9,000 from departments within TMU. The Ted Rogers School of Management at TMU, is a signed Luminary Charter Partner. This contract details our shared responsibilities towards one another and serves as our research agreement for this project. This project received approval from TMU's Research Ethics Board in 2021 (REB: 2021-108).

This data was collected to serve multiple research projects and purposes. It was also collected to a) serve Luminary's mission to bridge the gap between Indigenous knowledge systems and academic research (N.A., 2024); b) inform an Indigenous innovation strategy developed by Indigenous Works in partnership with Nations and communities across Canada (Lendsay & Hall, 2024); c) to describe Indigenous engagement in research-based career paths (Laplume & Mihalicz, 2021); and d) to reconcile inconsistencies between economic theory and empirical evidence by proposing a new lens through which decisions to pursue PSE can be better understood (forthcoming). All of these are outside the scope of the current chapter which serves as a factor-driven qualitative elaboration of the five determinants of university attainment identified in Model 3 (Sect. 4.6.2).

Over the course of 18 months from April 2021 to October 2022, we hosted a series of semi-structured sharing circles and individual interviews to capture information about Indigenous students experiences in postsecondary environments, their relationship with education, and key motivators, enablers, barriers, and constraints. Indigenous Works has been involved from the inception of this research project and have ensured that the research follows the appropriate protocols. They have extensive experience and credibility within the community and are celebrated leaders in Indigenous awareness and economic development planning.

5.3.1 Sample Selection and Recruitment

The population of interest for this study is students who are over 18, self-identify as Indigenous to present-day Canada, living in Canada, and have earned a qualification from a Canadian postsecondary institution. To satisfy these criteria and that of the other previously stated purposes we agreed to focus recruitment efforts on Indigenous graduate students enrolled in programs at Canadian universities.

This eligibility criteria is a good fit for this study—the factor-driven explanatory investigation of the primary determinants of education level amongst postsecondary graduates. First, it provides a sample composed exclusively of postsecondary graduates who are enrolled in programs at Canadian universities which is necessary to tie the qualitative findings to results from the quantitative analysis of the 2017 APS presented in Sect. 4.6.2. Second, it reduces representativeness bias. University retention rates for Indigenous undergraduate students is an ongoing concern in Canada. If the sample was composed primarily

of undergraduate students, a number would likely fail to complete their program and would need to be retroactively removed to provide an accurate comparison to the sub-sample used in Model 3. Third, evidence suggests that current graduate students provide better quality data and more reliable responses than that of undergraduate students. These students tend to be more mature and provide more thoughtful and detailed accounts of issues they have or are experiencing (Kahneman, 2003). In fact, Amos Tversky and Daniel Kahneman conducted most of their early experiments on graduate students because they believed them to be more attentive and motivated and that doing so would result in higher quality data (Kahneman & Tversky, 1979; Tversky & Kahneman, 1974). Fourth, their current enrolment allows for accounts of recent events rather than relying on the faded memories of experiences that happened years ago such as those provided by alumni. There is a substantial body of literature on witness testimony reliability which clearly indicates that the accuracy of recollections diminish significantly over time (Debus, 2008; Fricker, 2016). Lastly, and perhaps most importantly, it ensures that our sample is composed of committed students who made intentional and informed decisions to pursue university. In this sense, this data provides insight into the decisions of Indigenous students who would later experience academic success.

Initially, participants were recruited through social media and email invitations sent to Indigenous students known to the research team. This was followed by a snowball sampling method where participants were encouraged to share the recruitment materials broadly with their peers. This is consistent with the relational approach guiding this research and consistent with best practices in Indigenous research projects where participants are distrustful of researchers or who have been harmed by research institutions. Like the stratified sampling method used to collect data for the 2017 APS, we followed a multiphase approach to ensure adequate representation across age brackets, identity groups, sex, disciplines, geographic regions and other socio-economic and demographic characteristics. A profile of Indigenous graduate students was created from the 2017 APS and used to inform targeted recruitment campaigns designed to collect data from groups of students that were not included or underrepresented in the sample. Matching the sample to this profile establishes another basis to compare qualitative findings to the quantitative results which identified the factors driving this explanatory analysis.

5.3.1.1 Interview Structure and Method

All participants are first invited to a two-hour semi-structured sharing circle with up to five of their peers and a community Elder. These sharing circles are structured similar to focus groups and have proven effective in other studies investigating the lived experiences of Indigenous postsecondary students (Pidgeon et al., 2014). In each circle, an Elder is invited to open and close the circle as well as to provide traditional counselling as needed. An underlying objective of these questions is to help unpack and dissect the transformational moments and formative experiences in students' educational journeys. Inviting Elders to

guide the circles is important in following cultural protocol, but also in creating a safe environment for students to share openly. Participants expressed their appreciation for structuring these talks as circle discussions and often shared deeply personal and profound experiences.

> *"I just want to say how, I feel so connected, after listening to everybody stories and sometimes when you go first you just kind of like ramble through the questions you don't really put in the like interpersonal meaning like allow our life journeys as Indigenous people, and you know, sometimes we forget about the importance of storytelling."*

> *"I expressed interest in both the shared circles, because that's part of my methodology as well, because I really believe in the power of circle."*

Following the sharing circle, participants are invited to participate in semi-structured individual interviews lasting between 60 and 90 minutes. These interviews are designed to give participants an opportunity to clarify or elaborate on previous responses and to give the research team the opportunity to ask participants about themes emerging from the data.

An audio and video recording of each session is produced and stored on the Zoom server. These recordings are then downloaded to the Toronto Metropolitan University Google Shared Drive and subsequently transcribed with the assistance of Zoom's closed captioning feature. All transcripts are then anonymized, annotated with notes and observations and cleaned to remove or correct any misspellings or errors created from the transcription software. Once anonymized, each participant is issued a unique identifier, and the data can no longer be tied to specific individuals. To further protect the anonymity of participants, all data is password protected at all times and encrypted on either the University's official Google Shared Drive or Microsoft OneDrive.

Due to the impact of the COVID 19 pandemic and the involvement of Elders, all sharing circles and interviews are conducted virtually via Zoom. Though not consistent with cultural protocol, it provided us an opportunity to include students from across Canada. It also had the added benefit of reducing undue pressure on participants by allowing them to share from the safety of their homes and offices. Lastly, it helped to mitigate some of the potential risks and undue pressures from the line of questioning. Participants were informed of the voluntary nature of their participation at every stage in the process throughout the interviews and that they can stop participating at any time by simply closing their browser.

5.3.1.2 Discussion Topics and Interview Questions

During the interview, participants are asked to answer a series of questions about their personal experiences and theories related to decisions to pursue PSE. All questions are selected from a question bank containing 36 questions (see Appendix 3 for the most frequently asked questions). Many of the questions relate to the availability and effectiveness of support services, the influence of mentors and allies, perceived costs and barriers, as well as personal motivators and preferences. This study is especially concerned with identifying and better understanding transformational moments and formative experiences in students' educational journeys. Participants are asked to describe these events in as much detail as they are comfortable sharing and reflect on how and why these experiences impacted their decisions to pursue or persist in their academic studies.

The interview questions revolve broadly around five topics: decisions to pursue PSE, experiences within university, community involvement/interest, research, and Indigenous innovation. Questions are loosely patterned on the critical incident technique to capture transformational experiences that may have influenced their decisions (J. C. Flanagan, 1949).

5.3.2 Summary Statistics and Sample Comparison

Our dataset consists of over 350 transcribed pages of text from 22 unique participants. These include 17 participants across 7 sharing circles and 17 individual interviews consisting of 5 unique participants, 11 follow up interviews with sharing circle participants and one sharing circle participant who declined a follow up interview. Our sample is majority First Nations females roughly evenly distributed across the 25- to 54-year-old age range. There is representation from a range of sectors, disciplines and identity groups as well as 8 of the 11 provinces. At the time of the interview, all 22 participants were either enrolled in a graduate program or in their final year of an undergraduate program with plans to pursue a master's program directly after graduation. Six are first-generation leaners, three have university-educated family members and the remaining thirteen didn't say. Nine of the ten categories of disciplines or major fields of study listed in the 2017 APS are represented in this sample with the majority pursuing degrees in social and behavioural sciences or law.

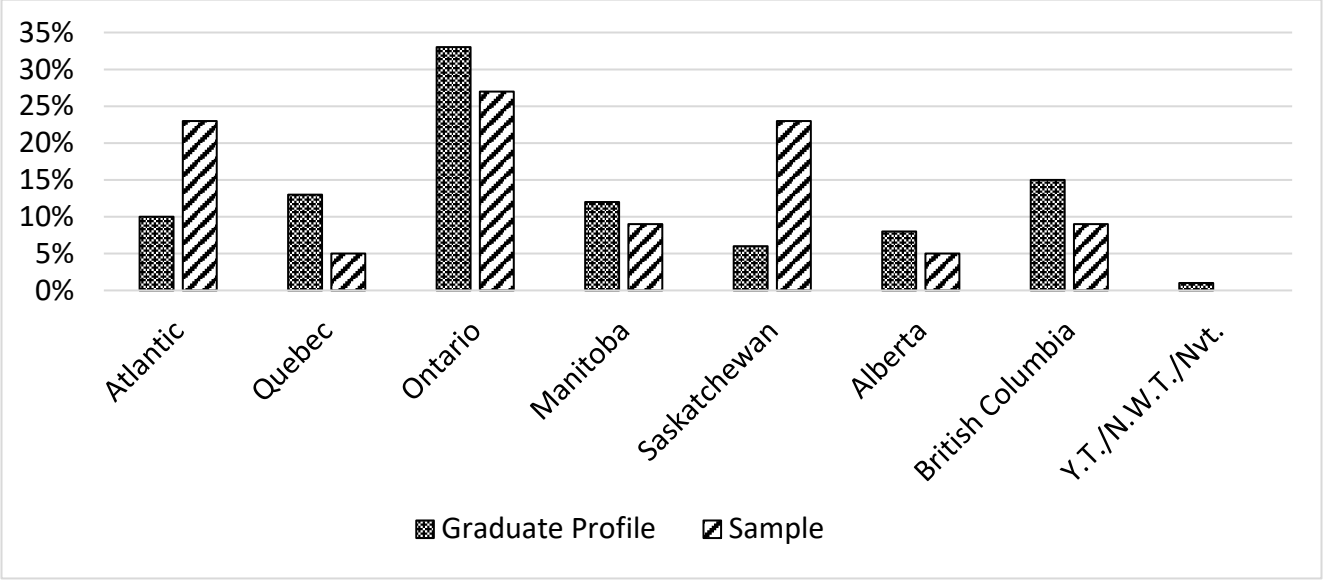
Table 5.1: Sample Summary Statistics.

Participant ID	Sex	Province	Education Level	Interview Duration (min)	Circle ID	Circle Duration (min)
33888	M	QC	Bach.	85	-	-
51153	M	MB	Bach.	-	SC#2	38
13891	F	ON	PhD	53	-	-
32921	F	ON	PhD	33	SC#1	45
36646	F	NS	PhD	34	SC#3	35
49404	F	MB	PhD	52	SC#2	38
57492	F	BC	PhD	-	SC#1	45
60645	F	ON	PhD	60	SC#2	38
62099	F	SK	PhD	45	SC#4	64
67455	M	SK	PhD	53	-	-
83599	F	ON	PhD	-	SC#4	64
84755	M	SK	PhD	55	-	-
24070	F	NS	Master's	59	SC#5	43
29868	M	BC	Master's	60	SC#3	35
50076	M	AB	Master's	56	-	-
64462	F	SK	Master's	57	SC#7	36
66459	F	NS	Master's	55	SC#3	35
74495	F	ON	Master's	33	SC#1	45
76061	F	SK	Master's	48	SC#6	76
78721	F	NS	Master's	27	SC#3	35
92838	F	NL	Master's	51	SC#5	43
61513	F	ON	Master's	-	SC#2	38

Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

All 22 participants indicated that the reason they pursued their postsecondary program was because they wanted to help their community and because it was an area of personal interest. 71% indicated that one of the reasons they chose to pursue their program was because it would provide them with stable meaningful employment, though only one third indicated that money was a motivating factor. Only 20% of students indicated that the reputation of the school influenced their decision which is consistent with the descriptives presented in Table 4.7. Over 60% also reported receiving adequate or good guidance about PSE which is roughly consistent with the 74% of graduates from the 2017 APS. Lastly, ten participants were raised in large urban centres while the remaining twelve were mostly raised on their home reserves or other rural Indigenous communities.

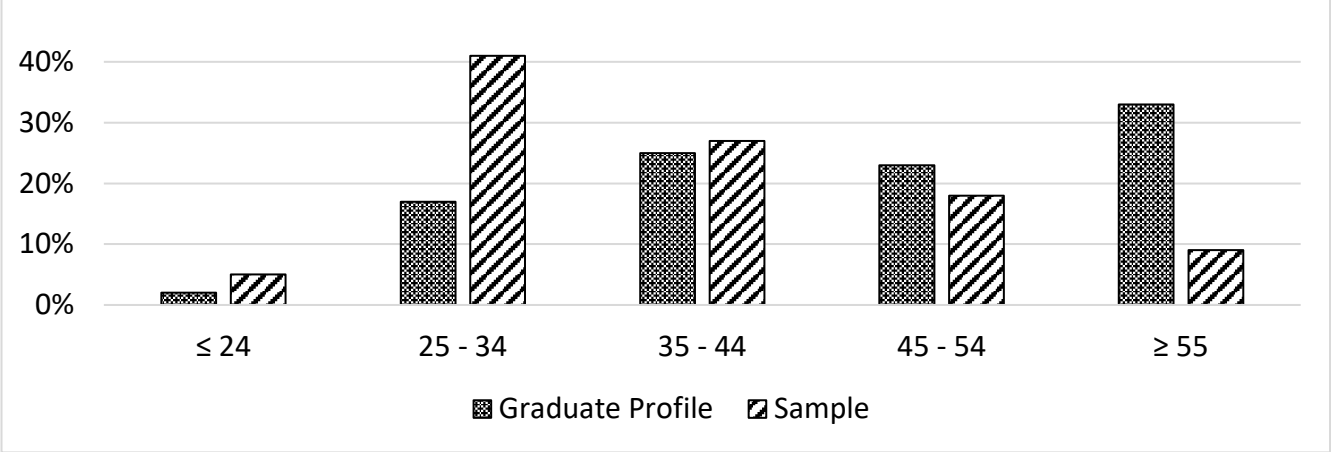
Figure 5.1: Sample comparison – Area of Residence.



Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

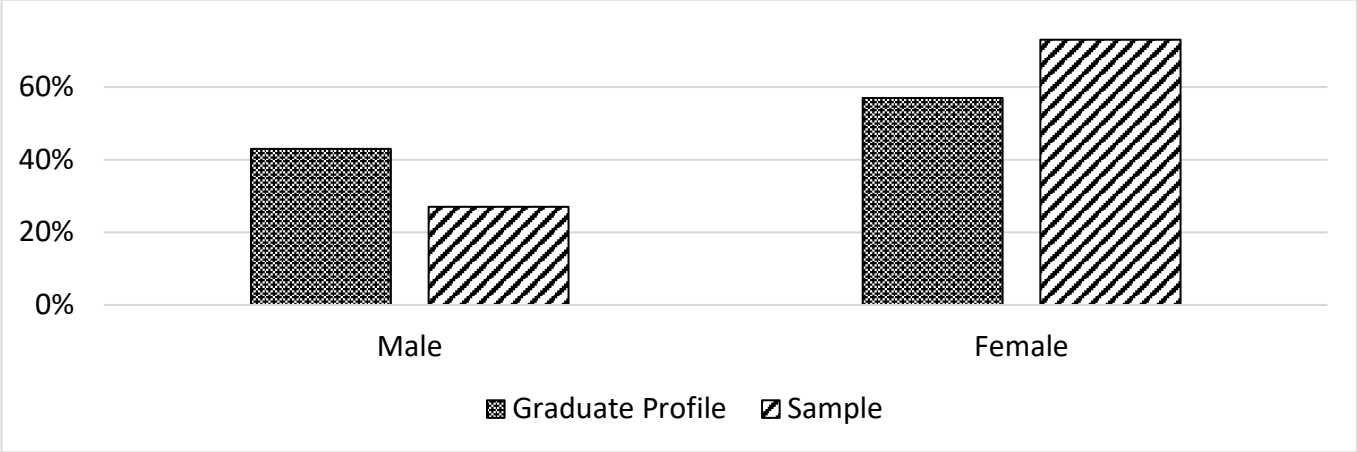
The age of participants varied with the youngest falling within the 18 to 24 age brackets to over 55 with just over two thirds of participants between the ages of 25 and 44. This is reasonably consistent with the demographic profiles of Indigenous graduate students constructed from the 2017 APS as well as previous studies finding that Indigenous students in Canada tend to pursue university programs later in life than the general population (Hango, 2011). Since the sample is restricted to current graduate students, participants are relatively younger than the profile.

Figure 5.2: Sample comparison – Age.



Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

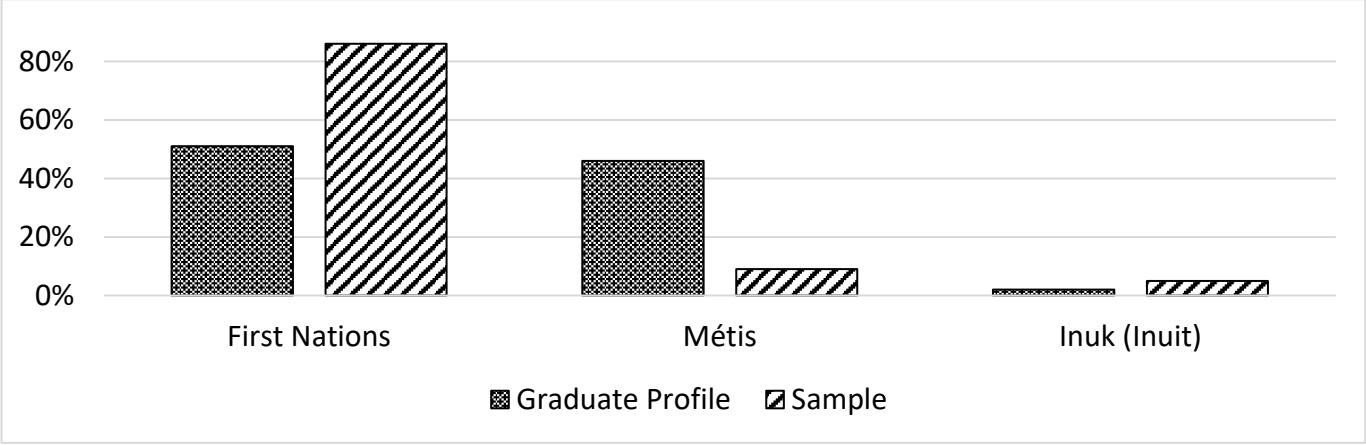
Figure 5.3: Sample comparison – Sex.



Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

Of the 22 participants, 19 were either Status or Non-Status First Nations, two were Métis, one was Inuk, and four reported multiple Indigenous identities. Those who reported multiple identities are not reflected in Fig. 5.4 since all participants identified more strongly with one identity and some and some Nations do not allow members to identify with more than one group. The disproportioned number First Nations participants is the result of the networks of the research team and the snowball recruitment method.

Figure 5.4: Sample comparison – Identity Group.



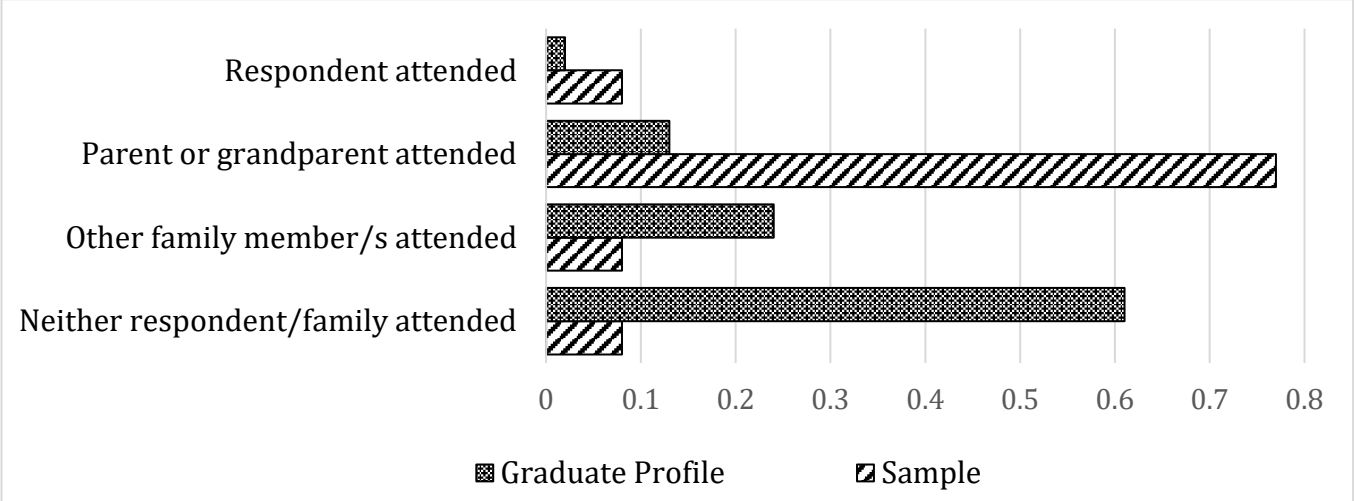
Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

25% of our sample relied solely on funds from other parties to pay for their PSE, while just 13% self-funded their education and the remaining 62% used a mix of their own funds and funds from other sources to pay for their education with the latter often being subsidized through various grants or scholarships. All participants reported being employed, most of which were employed on a part time basis working in a position that was made available to them through their program.

Figure 5.5: Sample comparison – Sources of Postsecondary Funding.

Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

Figure 5.6: Sample comparison – Residential School Attendance.



Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

The percentage of participants in our sample with at least one residential school survivor in their immediate family is far greater than that of the graduate student profile. Notably, however, the non-response was much higher in the sample. Only 59% of sample participants mentioned their connection compared to 81% of those included in the graduate student profile. At the time this data was collected, news of the unmarked graves of children discovered on the sites of former residential schools were just starting to flood in. Many shared openly about their connection, though we did not feel it appropriate to burden participants with these questions.

5.4 Data Analysis

This study adopts a directed content analysis as described by Hsieh & Shannon (2005) to deepen our understanding of why certain factors are found to influence Indigenous students' decisions to pursue university programs (Hsieh & Shannon, 2005).

Topic segmentation: As described in Sect. 5.6, this data was collected to serve multiple research projects and purposes most of which are outside the scope of this study—a factor-driven qualitative elaboration of determinants identified in Model 3 (Sect. 4.6.2). The analysis began with an initial familiarisation and segmentation of the data based on broad question topics. This segmentation focused on identifying and labelling responses to questions that are only tangentially related to the factors of interest. These labels improve the reliability of these findings by ensuring that responses are directly relevant to this study as well as to exclude unrelated topics that might conflate findings when performing queries, searches or other automated analyses.

Case classification: A series of 29 case classifiers were created based on the models developed in chapters 3 and 4 using the 2017 APS. These include age, identity group, culture, Nation or community, sex, gender identity, province or territory, population density, highest level of education achieved, current student status, first-generation student, program discipline, reason for program choice (jobs in field, money, length of program, reputation, recommended, personal interest, and wanted to help community), postsecondary guidance received, postsecondary funding sources, residential school attendance, employment status, tenure at current job, occupation skill level, and occupation category (NOC 2016). All case classifier definitions are drawn from Sect. 3.5.2 and the 2017 APS Data Dictionary (Statistics Canada, 2017). These classifiers serve to match our sample to the 2017 APS graduate student profile described in Sect. 5.3.2 and allow for more focused queries.

Descriptive Coding: The initial coding revealed 320 distinct codes containing 1,813 references across all 34 files. After merging duplicate codes and nesting those that were too narrow in scope, the codebook was reduced to 296 codes containing 1,557 references. Despite being a factor-driven qualitative elaboration, descriptive coding is necessary due to the nature of the discussions in which participants were often not directly asked questions about the factors of interest. Instead, participants were given the latitude to share openly, and an understanding emerged from Elder-guided discussions. This is also more consistent with Indigenous traditions of storytelling and Eagle feather teachings.

Code consolidation: The descriptive codes are classified into predefined categories reflecting the influential factors from the Model 3 post-estimation analysis in Sect. 4.7. These include sources of funding,

reasons for program choice, guidance and recommendations, residential school attendance, and sense of belonging. This stage is where the directed content analysis used in this study diverges from inductive thematic analyses. It is also largely what grounds participant experiences in the quantitative results which prompted the current investigation and provides a final opportunity to reorganize, consolidate and unpack experiences according to their relevance to the factors of interest. At this stage, a within-factor interpretive synthesis is performed to derive additional insights from relationships between dimensions within each factor.

Theoretical Mapping: In the final stage of this analysis, all experiences are mapped onto the frame of reference presented in Sect. 4.3. This frame of reference is derived from the literature review in Sect. 4.2, which identified the factors included in the hierarchical logistic regression described in Sect. 4.5, which in turn established the significant determinants of decisions to pursue university degrees listed in Table 4.9, and from which the factors of interest in the present study are drawn. In this stage, experiences are classified into one of four categories—barriers, enablers, motivators, and demotivators. The purpose of theoretical mapping in this study is to further contextualize these findings and draw conclusions on the nature of these decisions based on the relative significance of factors affecting access to university education and those affecting preferences in pursuing them. Readers are referred to Sect. 4.3 for more information on development and implications of this classification.

5.5 Findings

The lived experiences of Indigenous students studying at Canadian universities largely echo what was learned from the previous analyses with some important nuances. Access to funding and lack of support are ongoing issues preventing access to graduate education as well as a number of factors relating to having to relocate such as family and community obligations and being disconnected from their territories, communities and support systems. Students rarely feel safe or a sense of belonging in these institutions and are often confronted with various forms of racism ranging from microaggressions to more overt and systemic forms.

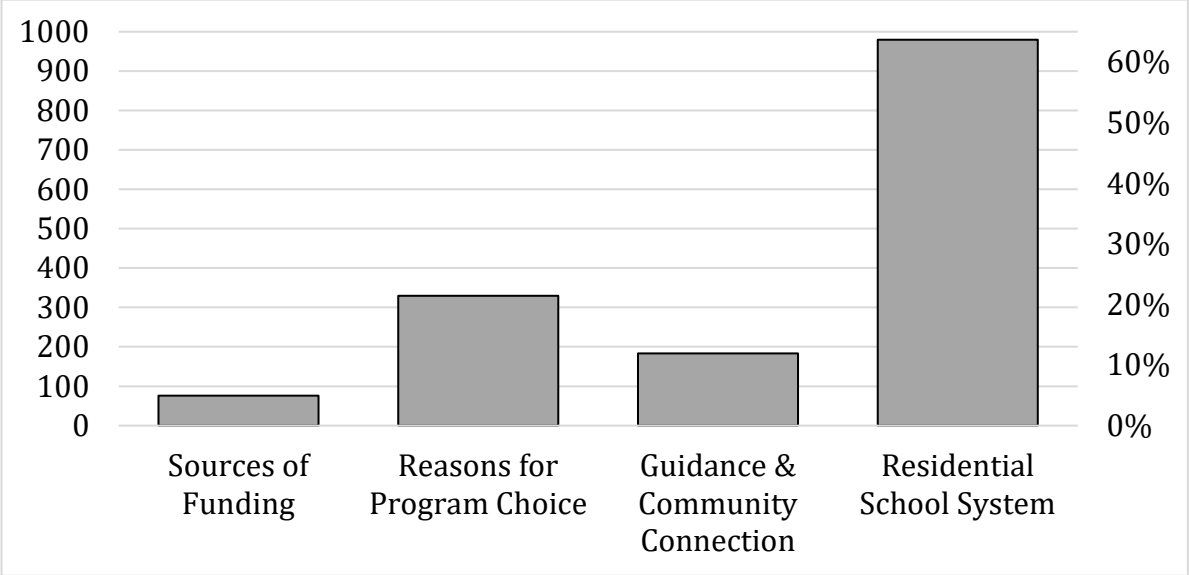
Table 5.2: Distribution of references by factor and subfactor.

Factors and Subfactors	References	%
Sources of Funding	76	4.8%
Government Funding Programs	38	2.4%
Decisions to Wait	7	0.4%
Willingness to Pay	10	0.6%
Underfunding Schools on Reserve	15	1.0%
Tracking to Remedial Programs	6	0.4%
Reasons for Program Choice	330	21.0%
Personal Interest & Purpose	88	5.6%
Money-maximizing Reasons	25	1.6%
Wanted to Help Community	186	11.9%
Listening to Heart & Spirit	31	2.0%
Guidance & Community Connection	183	11.7%
First-generation Students	19	1.2%
Role Models	58	3.7%
Allies & Mentors	49	3.1%
Community Orientation	57	3.6%
Residential School System	980	62.5%
Intergenerational Trauma	113	7.2%
Perceptions of Public Institutions	141	9.0%
Cultural Differences & Belonging	355	22.6%
Experiences of Racism	52	3.3%
Self-perception	122	7.8%
Indigenous Identity	47	3.0%
Connection to Culture	150	9.6%

Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

In the code consolidation stage of the analysis, all codes are disaggregated, reorganized and reclassified according to their relevance to the factors of interest as depicted in Table 5.2. The distribution of references across these factors indicates a significant emphasis on non-financial factors over those consistent with rational money-maximizing behaviour. This is especially pronounced in the themes relating to the consequences of the RSS and the intergenerational trauma that these Nations carry. The RSS and participants' sense of belonging in university were combined due to the inseparability of the factor dimensions. Additionally, this data was collected at a time when the media was being flooded by reports of the unmarked graves being uncovered at the sites of former residential schools. Together these factors are likely responsible for the disproportionate volume of references shown in Fig. 5.7. They do not, however, account for the high volume of references relating to cultural differences. 22.6% of references in the dataset are classified as relating to cultural differences and belonging, a third of which are related to the lack of Indigenous representation on campus. The incompatibility of knowledge systems and cultural differences in the context of centuries of institutionalized racism and social exclusion have profoundly shaped students' sense of belonging and self-perception.

Figure 5.7: Distribution of references across factors.



Source: Constructed by author using author-collected data (REB Ref.# 2021-108).

5.5.1 Access to Capital and Sources of Funding

"For the majority of my life—Just trying to get by—Just trying to survive."

Findings from all three models presented in chapters 3 and 4 indicate that we should be cautious when considering the wholesale adoption of theories which depend on financial incentives as the primary factor driving student decisions to pursue a PSE. Instead, these decisions are better explained using non-financial factors as explained in Sect. 4.6. Despite this, access to funding is widely reported as one of the most significant and enduring barriers to PSE faced by Indigenous students in Canada (Finnie et al., 2010; Restoule et al., 2013). It is reported more often than it is for the general population (Ottmann, 2017) yet Indigenous students, on average, have more funding opportunities and receive more government aid than non-Indigenous students (Finnie et al., 2010). Other studies have shown that financial barriers have a negative effect on the educational attainment of Indigenous students even after controlling for income and other economic, geographic and socioeconomic factors (Mukan et al., 2016). This section seeks to explain and unpack this apparent inconsistency by learning from students about their experiences with access to capital and sources of postsecondary funding.

5.5.1.1 Sources of Funding for PSE

Participants often shared openly about their financial challenges or situation, though they were not asked any personal finance questions directly. Notwithstanding the few who are fully funded, most participants reported access to capital as one of the main barriers to PSE, *"One of the things that I mainly faced in my Indigenous journey, education journey, was lack of funding."* When asked to describe their motivations

and barriers, financial considerations were consistently discussed and most often framed as barriers, "*The barriers for me were financial barriers."* Even amongst those who are fully funded or the few being partially funded by their bands, it was often cited as a barrier for others in their Nations. Notably, not everyone described financial considerations as barriers. A few participants described it as being one of the main reasons why they pursued their program. These and other reasons for postsecondary program choice are discussed in Sect. 5.8.

5.5.1.2 Treaty Rights and Band Funding

Most Indigenous postsecondary graduates relied entirely on funding from external sources to pay for their education, yet those who do are significantly less likely to complete a university education and less likely to earn a higher income after graduating. Sect. 4.7 suggests that the GoC's failure to honour its treaty rights in full have led to restrictions on postsecondary funding which may be effectively amplifying and perpetuating the education gap. This is, however, only partly substantiated in our discussions. While the worsening of the education gap as a whole cannot be attributed to underfunding, it is forcing many students to pursue less costly local programs over university degrees. *"There are a number of individuals who are members of a First Nation but may not necessarily be awarded or selected for funding to pursue their PSE."* The common theme when students were asked about government-sponsored postsecondary funding programs is that there is simply not enough of it (H.5.1). *"It's a forever issue with Indigenous communities, lack of funding."* They described it as necessary in their communities but framed it not as extra funding available to Indigenous students but instead spoke of it as an unreliable and scarce resource that their communities depend on.

> *"That's just generally kind of the attitude I've heard towards these funding programs is that there's just A) not enough of it, and B) like, there's just inherent problems with how they're operated."*

Most of the participants were not receiving band funding and this seems to be related to differences in band funding selection criteria which prioritize undergraduate direct entry students.

> *"The difference at the graduate level is that they give priority to like the undergraduate students so by the end of that there's no funds left for us right which is awful because, you know, as a mature student returning for higher education there's a lot more financial things that go along with being an adult."*

It was, however, consistently acknowledged as a widespread problem that is becoming more pronounced. One participant specifically noted the 2% funding cap described in Sect. 4.2.3 as a contributing factor. *"It is probably one of the most challenging areas for any Indigenous student, first Nations student across*

Canada where the existing programs postsecondary programs that they have are reliant on government transfers. And unfortunately, back in 1992, when there was a freeze in postsecondary funding and just basically pegged to inflation, 2% per year. The population has grown substantially. Yet that pool of money has basically only grown 2% per year, substantially reducing Indigenous students, First Nation students' ability to basically acquire PSE. That basically meant, you know, the cost. The financial burden falls, you know, squarely on my shoulders. And you know my wife as well, my family as well."

In addition to bands not being able to fund all eligible applicants, the funding available to those who are selected is often not enough to cover all of the costs. *"They do have really outdated funding policies. My policy is, like, dating back to the late 1980s. You know, this is what they were giving single students in the 1980s."* This is especially problematic for university education which often requires moving to a large urban centre where the cost of living can cost several times more than tuition. Participants shared how this can drive decisions towards less costly programs that are located within commuting distance to their home community. One in particular explained how they were forced to live at home and commute to school despite receiving band funding.

> *"Our communities are supportive of, you know, their students going to PSE, unless you know their funding doesn't allow them to. So, for example, I have to live at home, while I'm with my mom and my sister while I'm doing graduate education and that's fine but that's because my FN can't afford to help me with an allowance."*

5.5.1.3 Decisions to Wait

As suggested in Sect. 4.7.1, an important implication of financial barriers and funding constraints is that they may be driving students towards postponing their PSE. The rationale was that the prospect of future band funding or scholarships might prompt students to frame any personal savings spent or loans incurred as losses that they would have not incurred had they waited. This is consistent with the economic approach proposed by Becker's HCT (Sect. 3.2) and the maximization of lifetime earnings proposed by Mincer (Sect. 3.3). It is further substantiated by the concept of loss aversion which suggests students will weight losses more heavily than equivalent gains and further drive decisions towards postponing (Abdellaoui et al., 2007).

Contrary to the hypothesis in Sect. 4.7, there is no indication that students made a wilful and intentional decision to delay their studies as a result of possible future funding or as a way to increase their lifetime earnings. Participants often delayed their decision to pursue a university degree but for different reasons. Some spoke of intentionally postponing their PSE after high school, *"it's more than just the moment. It took years."* Though few described it as a decision, let alone one that was wilful and intentional. Those who did

decide to delay their studies, tended to justify it as either part of their process or from a wellness or cultural perspective.

> *"My mum did attend an institution and also was an intergenerational survivor. And, as a child of a survivor, the choice to go to postsecondary was… it came later in life."*

> *"Some of the things that we are thinking through is the length of time, the process, the different kinds of ideas that we have as Indigenous folks, and the time it takes to really think through those things."*

Importantly, band funding programs for university degrees are not 'all or nothing' as previous assertions might imply or suggest. The funding provided to successful applicants often only covers a portion of the costs and students are required to pay the difference from loans or savings. This is consistent with Model 3 results showing that those who use a mix of their own funds and funds from other sources to pay for their education are significantly more likely to attend university.

> *"You know, the programs that they do have available are like just, very, very minor, temporary emergency type loans or grants or whatnot to get them past that moment of time."*

Additionally, the probability of being funded is sometimes consistently low regardless of the priority systems implemented by bands (Monkman, 2016). Therefore, being out of school for an additional year would only marginally decrease the probability of an already unlikely successful application in subsequent years. Based on the general shape of decision weights in decision making under risk, this change in probability would likely have little-to-no effect on decisions to wait (Kahneman & Tversky, 1979).

5.5.1.4 Underfunding and Tracking to Remedial Programs

Literature suggests that rates of university attainment are directly related to the quality of secondary education (Henderson et al., 2020). When considered in the context of the systemic underfunding of on-reserve education (Sect. 4.2.1), it stands to reason that this would be contributing to low university enrolment rates amongst First Nations students. Importantly, it is also closely related to the tracking of students within these communities to remedial programs. As hypothesis H.5.1.2 suggests, this underfunding creates more tangible barriers by not having the ability to hire teachers who are qualified to deliver the courses that are required by most university programs.

"I didn't have enough credits. I was one credit short for university, and my teacher was like a guidance counsellor. She was like, you know one credit short… Don't put all your eggs in one basket. Go to college."

In other cases, this underfunding means that they can't provide the equipment, resources or extracurricular activities that promote interest in higher learning. Experiential and observational learning have always been cornerstones of Indigenous ways of knowing and learning (Sect. 2.2.1). Over half of the participants (12) described experiences and exposure to the discipline or career path as a driving factor in their decision to pursue higher learning or a professional career.

"I honestly didn't really know what I was getting myself into when I went into… First of all, my Bachelor of Education, because obviously that wasn't my dream and that wasn't my goal. It was just something that I learned to love and what came natural to me. It came easy, so I realized that would have been the place for me."

In almost all cases, on-reserve schooling was considered sub-standard, and few described them as preparing them for university education. This is consistent with Resoule et al. (2013) who report that over a quarter of on-reserve students who participated in their study felt that the staff at their high schools didn't expect them to succeed in either high school or PSE (Restoule et al., 2013).

"A lot of teachers in the North have kids, but they don't send their kids to the schools they're teaching at. So, like the teaching standard I grew up with and always was all right, but it wasn't good enough for their own kids. […] and it's been that way for over 100 years. I mean a lot of the missionaries for our kids sent their kids to school overseas like in Britain, or something. So, that continues in a sense to this day. […] I think if I grew up in a southern school in an urban setting, I think I would have had that credit. I would have had that extra credit and say the higher GPA, and I would have made it into postsecondary."

The underfunding of on-reserve schooling and the tracking of Indigenous students to remedial programs is closely related with several other factors previously discussed. For example, the underfunding of on-reserve schools leads to increased high school dropout rates, lower grades, less interest in higher learning, fewer opportunities for funding, diminished sense of self-efficacy and lower acceptance rates. The combined effect of these factors can amplify their effects by an order of magnitude.

5.5.1.5 Willingness to Pay

Findings from these discussions do not substantiate the proposition that Indigenous postsecondary students are less willing to pay out of pocket for their education. Rather than an unwillingness to pay, for most it's an inability to pay. Contrary to hypothesis H.5.1.1, most students don't have access to the capital needed to pay for a university education. Those who do, exhibited price sensitivity and ambiguity aversion though there is little evidence to suggest that this is the result of their frustration with government postsecondary funding programs.

> *"At first, it was just absolutely terrifying jumping into paying for something that you have really no idea if there's going to be a benefit to myself or to my family after I achieve it right? So, what type of toll does it take on me—mentally, physically, and you know, spiritually?"*

Participants tended to focus more on the costs of university education rather than the benefits and we did not find examples of students weighting objective costs against benefits. Additionally, these costs are rarely described in monetary terms *"you're trading something for your time in university."* In most cases, family and community were described as a critical factor in their success. They also describe the cost of this support incurred by their families and communities as well as what it costs them to be further disconnected from their culture.

> *"And what does that toll take on my own family? Knowing I'm basically shutting myself off from them, being so heavily invested in doing my own research, just getting through the courses right."*

> *"When you're in your home community like you're generally active. You know that you're generally accomplishing things, you know. That might not seem like that important in the institution, but they are important at a community level like back home. You're trading your time like that could be learning better learning better locations of seal hunting spots could be finding new access for new to me, anyway new access routes up into the country, you know, for caribou could you be looking for spots for polar bears like there's living a pretty active lifestyle, even if we're not like accomplishing a degree."*

Participants described the non-financial costs they incurred such as their disconnection from their families and loved ones. Since universities are almost exclusively located in large urban centres, those who grew up in rural areas are often forced to relocate. This was especially pronounced amongst the 12 participants who were raised on their reserves or other rural areas.

"One month of classes, away from home, away from territory… That was really you know, a struggle, because I had never been away for longer than a couple days or two or three days so for me being away from home [felt] like a lifetime."

"I miss my people and I miss gathering, they must be staying and I miss all of those great feelings that are generated from those sorts of events."

Most, however, were disconnected from a young age and don't have the same community-orientation or deep-rooted ties. *"I was put into foster care when I was a child, like a baby."* Those who grew up in foster care, including 60's scoop survivors, face their own unique set of challenges but did not describe the costs of attending university in the same way as those who grew up in small tight-knit rural communities.

Another important aspect of willingness to pay that has not been fully explored is aversion to debt. Admittedly many of these factors similarly affect the non-Indigenous population and cannot account for such a large and enduring gap in rates of educational attainment. Especially when considering the availability of student loans in Canada that are available to all students regardless of income or assets (Sect. 4.2.3). In most cases these loans are accessible and provide sufficient funding to cover basic needs in the cities where universities are located.

5.5.2 Guidance and Recommendations

Only 20% of students indicated that the reputation of the school influenced their decision. Unlike the quantitative findings, however, over 80% of participants indicated that they based their decision to pursue their current degree, at least in part, on a recommendation. This recommendation often came from an Indigenous mentor or role model from outside their home community later in life. Over 60% also reported receiving adequate or good guidance about PSE. 40% of participants reported receiving guidance about PSE that was either negative or inadequate. These reports often came with stories about how they were belittled, shamed or made to feel inferior by authority figures or loved ones in their home communities, often in their formative years.

"I was weighing the pros and cons about grad school because I didn't think I was good enough to be a graduate student. And, and so that came from years of Indigenous and non-Indigenous community members telling me that I was a dumb Indian, that I would never amount to anything I would never leave [my reserve], that I was a stupid faggot, that we're just going to, you know, live on the 'Rez' for the rest of my life. And I believed that for a very long time. And so, it was hard for me to process and get rid of that distorted thinking that I had. But because I grew up with it."

All participants who reported negative or inadequate PSE guidance were either Inuit or First Nations. Coincidentally, the two who reported negative guidance also happened to be the two participants still completing their undergrad. These individuals are both older than the average age of Indigenous undergraduate students and those who reported no or inadequate guidance are among the oldest in this sample when compared to their peers pursuing the same level of education. These two identity groups were identified in Sect. 2.2 as having consistently lower levels of education despite having the highest returns to education. This is consistent with earlier findings suggesting that those most likely to have grown up in rural communities with underfunded educational systems are significantly less likely to complete a university degree than those growing up in urban centres (Table 4.9).

Conversely, all of the participants who reported receiving adequate or good PSE guidance were among the youngest in their education level. In fact, all of the doctoral students between 25 and 34 years old, the youngest age bracket for doctoral students, reported receiving good PSE guidance. This trend seems to indicate that students who receive adequate or good guidance about their options for PSE start earlier and those who received negative or inadequate guidance tend to delay their postsecondary studies. This reinforces the lack of information on many reserves as an access factor that is perpetuating the education gap.

5.5.2.1 First-Generation Learners

Six of the participants in this study are first-generation leaners, three have university-educated family members and the remaining thirteen didn't say. The first-generation learners described some of the challenges they have had to overcome. These were described as fear of the unknown, lack of role models and access to information, feelings of insecurity, uncertainty, unfamiliarity, and all couched in a diminished sense of self-efficacy.

> *"I'm the first person in my family, you know, and it's like you're brought up in these experiences where you don't really know if you're going to be able to get out or if you're just going to, you know, continue those familiar patterns."*

> *"When I talk about like me having this privilege to access education is because of that right, a lot of our communities are my family members, living in communities they don't have those people."*

> *"Students that I've met don't come from families who've done it. The folks who come from families who have university degrees and so forth, can give a little bit more support in that way of life showing people how to learn these things. But if you don't come from that it's really difficult to learn."*

"My mom's side of the family, the Metis side, all the women had gone to PSE and had at least a Bachelor's and my mom had a master's and, you know, etc. So, that was kind of normalized. On the Metis side of my family, on the first nation side of my family, I was the first one to graduate any postsecondary, on my father's side."

5.5.2.2 Lack of Role Models in Rural Communities

Lack of role models in communities emerged as a significant factor negatively affecting decisions to pursue PSE. Some participants were able to overcome this barrier, but even those who did acknowledge it as being detrimental.

"So, back when I thought about going into university there wasn't anybody, that was a mentor to go into university. There was a mentor of failure, and so one of the community members had gone to university had failed miserably completely bombed out."

"We do things because what we see in our community, these are our family members so that's a big piece and they're still this like there's still this feeling of powerlessness, so I think that the more that our younger generations see successful Indigenous people doing cool stuff."

Some participants had good role models in their communities who had a positive impact on their decision to pursue their degree. In almost all cases, the role models influencing these decisions were Indigenous community members who overcame obstacles and ultimately succeeded.

"My mom has a master's and I always kind of wanted to at least match her achievement […] I saw that the master's really opened up a lot of employment opportunities for her. So that she was able to, you know, become a home homeowner and things like this that a lot of Indigenous women, single mothers wouldn't normally have access to without like generational wealth."

Some of the most powerful stories of influential figures came from those who had family members who were university graduates and provided mentorship, advice and motivation. Even amongst the first-generation participants, many drew strength from family who believed in them and encouraged and supported them.

"My grandmother always told me that if I become a lawyer, I'm going to spend a lot of time in the office with paperwork and dealing with people and it's not really a happy environment. And where she

raised me, I knew she knew best so I just kind of listened for like… maybe you could say for… not the first time. But it's not often that I listen to people's advice."

"I talked with them and they said no, actually you're going, and if we have to have garage sales or rummage sales so bake sales you're going to university."

One participant described how they hold themselves accountable to their family and the pressure they were under to succeed. They described the sacrifices their family made for them to be there and how failure wasn't an option.

"I feel… And I always got scared that I will be letting them down if I didn't land a professorship job or an academic job because they made sacrifices and I made sacrifices and I want to honour their memory as best as possible."

"I've had so many relatives, many of whom chose to join the ancestors prior to me and I'm still here and they always encouraged me to continue on to pursue this academic career."

Not all communities support members going off to university. *"The community is not necessarily supportive of people going to postsecondary or university, necessarily."* In some cases, it led to participants being further estranged and alienated from their communities and cultures. This is often described as resulting from a lack of understanding or insecurities in the community.

"It's a real, really big change in... It's hard for even them to understand. Like. Yeah, they know we're doing something imp... I think they know we're doing something important. But I don't know if they really know what a bachelor is, or a master is in our PhD."

"On my other side of my family like my dad's side of my family it's very blue collar and I feel like there was a lot of pressure not to be better than anybody else."

"I already said it, from people that, very non-urban people, it's kind of like a bad thing to go to a city. It was viewed as a bad thing, you know, at a community level and right away is to go into a city. So, a community perspective on you with, like, I don't know if it was favourable or not, so probably not."

Closely related to the lack of mentors or role models in communities is inadequate guidance and the availability of information (Sect. 5.8.3). In some cases, the information necessary for students to make informed decisions simply isn't available and they don't know anyone who can teach them.

"There's so much information that's not accessible for our people and it's not accessible in a way that our people understand."

"I really didn't know a lot about university at the time I was, I guess, halfway through my BA, when I realized that there was a difference between a four-year honours BA and a three-year BA, and that if you wanted to go to grad school, you had to take the honours program."

"If you don't really know what sort of conditions you're gonna end up in, you don't really know what exactly is going to happen."

5.5.3 Reasons for Program Choice

5.5.3.1 Wanting to Help Community

The two strongest motivators driving Indigenous students in Canada towards pursuing a university education at or above a bachelor's degree are personal interest and wanting to help community (Sect. 4.7.2). All 22 participants indicated that the reason they pursued their postsecondary program was because they wanted to help their community and because it was an area of personal interest. Of the two, wanting to help community stood out as a stronger motivator. In most cases, wanting to help community was described not as a desire but rather as though it was their duty or that they were honour bound to give back.

"I feel like my responsibility to my community is to be able to support my community members and upholding the responsibilities that they have, and I feel like garments can play a really important role in that."

Consistent with hypothesis H.5.2.1, many participants spoke of wanting to help community, not as a motivating factor, but rather as a sense of duty or profound obligation. For some, this duty is rooted in the suffering of their ancestors so they could have these opportunities and the debt owed to them for their suffering.

"I know that education is invaluable […] If I'm able to pursue education as a result of my ancestors having suffered. I'm going to do that, like that's my duty, you know, is to teach other people like me, and show other people like me that they can do that too."

This debt was also sometimes expressed as owed not to their ancestor but to their living relatives. The way some participants described it seemed as though they felt guilty when they weren't working to better their community.

> *"Yeah, right now I feel the void more because I've worked in culture for like about 5 years, and so I've made serious contributions to my community, and I feel more at ease with that. Now I got to like, approve of myself."*

This guilt extended beyond an internalized sense of duty or the repayment of a debt to what felt like a type of survivor's guilt. The sense was that they were somehow fortunate enough to be in this position and that they left their loved ones behind, many of whom continue to struggle.

> *"All these like, other elements such as experiencing, like, loss of self-identity, addictions and witnessing suicide, right? And all this built up. And where I was invited to like, I was already thinking about, I think I want to make a positive impact right for our people."*

> *"So, I could be helpful to those, some of us, any of those students that experienced what I have… many of us have gone through, and are going through, and will continue to go through. So, I stay connected."*

Almost half of all participants expressed their desire to break down barriers to education and pave a path for the next generation of learners. *"I'm doing this work to pave the way and, like, pave a pathway so that others can follow behind me."* Most often this seemed to come from their own lived experiences and the challenges they faced along their educational journeys. In a sense, they had to overcome many challenges along the way, and they are personally committed to ensuring that others don't have to go through what they went through.

> *"At the same time, I'm still trying to make a path for younger Indigenous students to follow, and you know, potentially make it easier for them not having to go through what I went through."*

> *"So, we're really paving the way forward, and I think encouraged and other young researchers, or old researchers, depend on the matter, the age, but really it's encouraging them to do research, not to be so, accepting of what's given to them and realize that this is a skill to be challenged in the field."*

> *"It's when people want to act on and break down barriers. Right? They want to make positive structural change for whatever is affecting them or wherever they are more sympathizing with."*

While not everyone shared this profound sense of duty to future learners or to the community, all participants shared bravely about the pain and suffering they have endured, *"I wish we could make it so that. Our peoples wouldn't have to face that going forward."* For those who did, often this sense of duty to the next generation seemed to come from this place of pain and anger. The trauma they carry has become a powerful motivator. There seems to be a strong sense of duty amongst them to decolonize these institutions.

> *"I'm starting to realize that I'm in, like, a really important position, and I should try to do everything in my power to, you know, help members of the Indigenous community as a whole."*

> *"I know the cost. I've already paid into the program. You know, this is what I have to do. But, so, I'm hoping down the road something can change where I can make it easier for other students to access higher education so that they can participate in Western academia."*

> *"So now...what part... how are our children's brains impacted by trauma and their ability to read and write. And what can I do on the front line, to help those children to achieve whatever it is they need to as they go into adult life, whether they're going to be a plumber, a language teacher, or a doctor, or whatever they're going to do."*

> *"It's like these skills that I've learned from members of my community and my family and kind of using these gifts that I really feel have been passed down to me through my ancestors, in order to contribute to Indigenous resurgence and land sovereignty and body sovereignty."*

In many cases, students took this one step further in finding ways to use their education to better their community (H.5.2.2). *"That's another thing that has been really motivating me is just to… how can I help my First Nation community with my education."* It wasn't just about giving back when they completed their degree, but they were actively searching for ways to better their communities through their education and research.

> *"My, the research that I've now chosen to do directly involves that, how do we take our traditional knowledge and share it online or share stories of ourselves in our own voices with our own representation that places us, you know, very much in the now and also in the future."*

Sometimes wanting to help community was expressed as wanting to become a role model for the next generation of learners. Six participants spoke of ambitions to become a source of inspiration for youth and

to serve as role models. These ambitions appear to be largely born from personal experience in those who lacked these figures in their upbringing.

> *"So, if I can inspire other young Indigenous people, then this is the reason why we do what we need to do. I'm not doing a PhD for kicks and giggles. I want to get back into the community, and I want to influence change, I want to be that voice of change. I want to say that's enough of this shit."*

> *"So, ultimately when I'm done with my education, I'm hoping that I would be able to go back into community and work with Indigenous peoples to basically be that motivator."*

> *"That's kind of what's important to me is, you know, like providing a positive impact to the Indigenous community, but just to all communities in general, like, I think that's very important to me."*

Closely related to the duty to help community—especially when it takes the form of breaking down barriers and paving a path for the next generation—is a need to decolonize the university or academy. This can mean becoming an ambassador, *"I sort of created a new role for myself as a go between with Indigenous and non-Indigenous,"* developing Indigenous courses or cultural awareness programs, volunteering their time to share their perspectives and worldview, or correcting misinformation, *"people have questions and I don't mind answering people's questions. This is also part of my education."* In most cases this was described as positive and working together to change the system from the inside to make it more inclusive of Indigenous ways of knowing, being and doing.

> *"I'm starting to approach these sorts of policy changes and things from like an EDI lens, from like an all equity deserving groups lens. Because, ultimately, like if we're tearing down walls like we're making these systems more accessible for people that need it."*

> *"I aspire to bridge cultures, because the Indigenous aspect of it has been missing, like I mentioned earlier, for over 400 years in education curriculum."*

> *"I'm really mean if you cross me the wrong way. You thought he'd say anything, but I don't want my kids or my grandkids… I will become really mean but it's only just to set people straight."*

> *"I'm just trying to break through and like to change people's minds and hearts."*

> *"I think the first step is, like, the mandatory courses, getting perspectives like mine out there. And then seeing how that would make changes for academia."*

"We're always in the media, usually negatively, and you know I want to. I try to be a positive person to try to find some change in that, you know, call these people out. You know, with our little case studies."

5.5.3.2 Personal Interest and Purpose

The second strongest motivator for university education from Model 3 is personal interest. Those who expressed personal interest as the reason they chose their program are 2.5 times more likely to pursue a university education than a lower level of PSE (Sect. 4.7.2). Personal interest is also found to be a primary driver amongst participants in the present study.

"Why I started it, aside from obviously wanting to kind of expand my horizons, and potentially explore something that I was interested in."

"When I was a kid in grade school in high school I used to say, I want to travel the world that's what I want to do in life, I just want to travel the world and see everything was like that is the definition of a geographer right there why didn't somebody say oh geography is some something you might really enjoy."

In most cases, the personal interests driving participants to pursue university programs was related to their culture. *"I decided not to take that route, because it was important for me to do something that was more Indigenous based."* Some participants described their interest in other areas, but even those in fields or disciplines unrelated to culture, their studies often involved culture. For example, one student studying computer science was writing their thesis on the underrepresentation of Indigenous knowledges in the data used to train large language models and cultural biases inherent in Generative Artificial Intelligence.

"That kind of incorporates an intersectionality of Indigeneity and AI, and that's kind of what my research is on. And I mean, that's kind of like where my thesis is going is Indigenous and AI and it just kind of became a maturity thing. And reflecting on my emotional state to kind of realize that that was something that I wanted, and that I was kind of passively working towards it without even realizing it."

"First of all, we don't have a lot of culture, cultural and language I'm not fluent but proficiency and understand the meaning behind that language and culture, and that was kind of like the kick-off to why I left and decided, I guess, three days before the education program started to go into education for the law."

"I sparked my own interest in education, you know, constantly reading different books constantly keeping your mind busy and, you know, positively making good changes for yourself, setting good goals for yourself."

Participants who identified personal interest as a significant motivator driving their decisions towards their program or discipline often described it not as a curiosity or something interesting, but rather as a passion, purpose or calling. *"I noticed when I was studying indigenous things, it did bring up feelings of identity for me. So, I can't completely say it was the structure. It was also maybe some personal things."* In many cases, it was also about something that was bigger than them like the resurgence or preservation of their cultures or the revitalization of their languages. *"My most important strategies were, like I said, trying to revitalize my culture."* Many of these responses were not, however, unprompted. One purpose of this research is to learn if and to what extent students who have found success in academia were connected to their cultures and the strategies they found helpful in maintaining that connection. What was not expected, however, was the scale of participants' disconnection from their cultures and communities. *"When I was younger, I'd kind of like look for people to try to fit in somewhere."* Every one of our participants spoke extensively of how they were using their studies and time at university to reconnect with their cultures and express their perspectives and worldviews with the world.

"I feel like there is a missing approach there. I think that the approach could be an Etuaptmumk approach. So, for example, not even just solely nursing, environmental studies. They could absolutely take an Indigenous approach and Environmental Studies. I have a really good friend who is an environmentalist. She's non-native, but she holds a lot of the same respects for the earth that we have. And I think Indigenous innovation is that it's situating themselves, situating itself, in academia."

Relatively few participants spoke their language, a fact that seemed to trigger deeply embedded emotions. Loss of language and culture is traumatic and described broadly as a threat to the future wellbeing of their families, Nations and communities.

"O*ne of the things that sparked my areas of research is, I guess, just sustaining Indigenous knowledge in general."*

"I just realized like I didn't go into this research saying, I'm just going to focus on language revitalization and work with parents. Now I'm looking at language revitalization health and wellbeing for parents of young, like pre-primary and toddlers, because there's a gap missing in the research. There's just not enough written material to support why language is so important for pre-primaries and toddlers and what's accessible."

This drive to preserve and revitalize language was described as fulfilling and purposeful work and participants were excited to share their efforts. Those who were in the process of learning their language described their efforts with a sense of pride and honour.

> *"When you see a community that they still have young children that are fluent in Micmac and can speak Micmac and so, for example, I feel like in my own home now where we just lost a fluent speaker that now the fluid is not know my grandmother still speaks to my daughter, and so teaching that language to her great granddaughter is so important."*

> *"I feel more balanced after being in those sessions and I don't speak Ojibwe or Saulteaux, but I understand some words. And the first time we had it the first morning I woke up, I was dreaming about it, as I woke up and I'm like what am I doing dreaming in Saulteaux, I guess that's just what happens because I was thinking about all these things and that's just how powerful the language is."*

The drive to preserve and revitalize language was often grounded in relationships. Wanting to not just keep it alive, but as though it was a gift that they were honoured and excited to share it with their loved ones. *"I'm literally learning my language, so I can speak it for my children to understand it."* For the few fluent speaking participants, it was described as their duty.

> *"Being able to like teach someone these practices and then them saying to me like I didn't have the privilege of growing up and learning this from someone in my family, because this knowledge was taken away from them, and so it couldn't be passed down to me being able to use the gifts that have been passed down to me through my ancestors, to be able to then pass that on to others."*

In almost all cases, those who identified personal interest as a motivator described it more as being guided by a sense of purpose, intentionality or spirituality.

> *"All the work is connected, you know. It's not I'm not doing something [biguanta] So in Cree if you're doing something just for nothing, then you know [biguanta] you're just doing something just to keep busy you know, none of the work I involve myself in is this one."*

> *"For me, because it is the language and it's involved in ceremony and it's evolving the spiritual work um it's just such a gift to be able to do the work we are able to do the research."*

> *"How I got on this path? I think it was when I reconnected with my birth family and started to be very curious about what it meant to be Cree."*

"It's like having a glimpse into the spirit of our language. The spirit of our language is multi-coloured, and it has multiple dimensions to it."

"We want to be water protectors, you know, let's like, waters all around us, like, we need water to survive. And I'm like, you know, just that little, it sparks kids so much, so much joy. And it really gives them a purpose."

5.5.3.3 Employment Opportunities and Financial Incentives

Sect. 4.7.2 describes the three reasons for program choice in the 2017 APS as directly affecting the NPV of PSE. These include money, program length, availability of jobs in the field. Participants put their careers on hold to pursue their graduate program and expect that their decision to do so would result in a negative return. This is consistent with findings from Models 3 (Sect. 4.5.2) showing that "Wanting to help community" is the strongest determinant of university education. As shown in Model 2 this is also significantly and negatively related to postgraduation employment income (Sect. 4.6.1). Some participants spoke of increased postgraduation income as a primary motivator, though many were describing motivations to pursue terminal degrees after graduation. Of those who spoke of their past motivations, many reported being initially motivated by financial incentives.

"As far as academia or a job or anything when I first went back to school. Sure, that was in, probably forefront in my undergrad."

"Maybe in my first pass I did it to have an occupation, you know. It was in applied linguistics, and I needed that degree to go teach overseas."

Others described similar initial motivations and how their motivations shifted when they started finding purpose and meaning in their work.

"I mentioned the reason that I first went back to school was to get a job, but part way through… I'm not sure where the change came from, but it was like […] was saying, all of a sudden, I was there because I wanted to learn. I wanted more knowledge. I wanted to know what was going on and then the research part too. How can I help people? What can I do that would make people's lives better or easier? And that became really important to me."

Others described employment-related motivations which tended to centre around job satisfaction and greater employment opportunities.

"I'm here, because this is going to further my job opportunities. I want to work with the province, I want to work with the government, I want to be more than just a classroom teacher."

"That was something I chose to go to that school or take postsecondary training because it was in a way to advance it. It opened up career opportunities."

"At some point, I decided I needed to go back to work. And I couldn't get any of the jobs that I thought that I deserved because I didn't have a degree, so I thought, fine, I'll get a degree."

"I wanted something that was a bit more rounded or fun, or whatever. I just didn't want to do bench work my entire life."

"Upon returning home afterwards, a lot of the jobs that were advertised required a bachelor's and I only had an engineering diploma. I didn't have a degree. So, after a few years I decided to go back and get into pay. And once you have a degree, you can apply to a lot of jobs that you otherwise wouldn't be able to apply for."

Job security was also described by some as being important. Many of these participants had experience working physically demanding jobs and appreciated the toll that it takes on their bodies. They described how many of the jobs available to them without a university education were risky and not sustainable over the long term.

"If you get injured, it's really hard to give that physical lifestyle too. So having a degree was on top of that was like a protection like maybe I got a mildly torn muscle, or, you know, strain, ligament or something, but with a degree, like, it's mostly office, a lot of this office space. So, on the road you got to keep working."

Participants also spoke of the need for stable income noting the volatility of part-time or contract work and how instability and uncertainty affect their ability to plan for their futures as well as the wellbeing of their families.

"I also wanted to have that stability to benefit the people around me because I wanted to be a source of support for them financially, emotionally, etc."

"I wanted to have a, not like the stereotypical good life but, just like a life of stability, where I wouldn't have to be worrying about budgeting every single thing or feeling guilty every time, I spent like a couple of dollars on something I wanted."

A few participants spoke of financial incentives as driving their decisions to pursue university degrees, however those that did spoke of the increased income in the context of injustice, pride, the respect of others or self-worth when comparing themselves to others.

> *"I want to give myself the most opportunities to do the most interesting projects to get paid better to, you know, to be taken seriously in different circles and stuff and to do that I need the PhD."*

> *"Both of them were making like three to five times more than I was, and both had full time jobs, and I was a part time employee."*

> *"And also thinking about some of, like, financial concerns and feeling like science would probably be a more viable career."*

Just as many shared how they didn't feel financial incentives influenced their decision at all, *"I don't believe that I'm doing this work for gain."* In one case indicated that they would have been financially better off had they not pursued their degree.

> *"I have never cared about having material possessions. For me, it's not something that I value. You need to have a table, but I would rather have a spot beside the Elder. I'd rather have a nice comfy plush cushion sitting on the ground, listening to the Elders because that's really, that's where we are getting our grounding from."*

> *"Because, honestly, like, if I was in it for the money, I wouldn't have gone into a master's degree."*

Finally, for some it was more a practical decision to maintain the momentum they had generated while completing their undergraduate programs.

> *"I'd already been in school for five years at that point. Why not get a masters?"*

> *"Once I finished my teacher's degree, I went and did my master's right away because I had more than enough time and presentations that I've done in the schools to accumulate for like two years teaching time I was supposed to do, I guess what led me right into being a researcher."*

5.5.3.4 Heart and Spirit

Another reason for their educational paths emerged throughout the analysis. Participants often felt guided by a strong sense of purpose which they described as listening to their hearts and spirits, *"but in my heart,*

I always wanted a degree in First Nations studies, that's what my spirit was telling me." Ten participants described being driven by or finding strength in a spiritual connection.

"I didn't even I don't remember sitting down and weighing out the pros and cons, by any means I just I really liked the connection I had with my supervisor so when I went for my first initial look for that first initial meeting we sat down, it was just going to be a very short meet and greet and 45 minutes later I'm like oh, my goodness I've got to get the class, it was just like meeting, an old friend and we just had that instant connection."

"It's like the intervention of learning about Indigenous language and really speaking to something that spoke to my soul and spoke to my whole purpose of why I'm here on this earth is to share my language, and to look at ways of strengthening the language."

"So here I am sitting there and that… at that moment in time is when I realized that, wait a minute like this... It literally had called to me."

"I said that we, the knowledge and the Creator heard me and said, [name] you are going to do a PhD. Like. Okay Creator, I'll do a PhD. And when you get that message, you don't argue with the creator, so I'll just say okay."

"I was told by ancestors to know like to learn my language."

"I'm lucky in the department that I'm in I think creator has just guided me into this position, where I am now for a reason."

"I can't have made it this far for nothing so I'm trusting the creator and different forces."

"I believe that the ancestors, and my mum are helping me through this research process through My thesis writing, I feel them and sometimes that is hard for non-Indigenous students to understand or my non-Indigenous instructors to understand that there's a spiritual connection I have with the work that I'm doing."

"The creator just gave me a chance, I guess, and you know something happened to me and then whatever happened and, I don't know… I don't… Look back and learn from it and just keep going."

For many this was an ongoing influence throughout their education, one that they drew strength from to push through barriers and persevere. In some cases, students were encouraged by community Elders to pursue this path.

> *"It was actually an Elder that I had met with a see-er, [name] from Six Nations, who had told me that I should do a PhD."*

> *"[Elder] told me that I should consider doing a PhD and not because it's not like a different it's a different type of intelligence that he said that I have so he said that I have that type of intelligence, that is able to do this kind of work, so therefore I should use it."*

For some this came in the form of listening to their hearts and deciding intuitively. Some aspect of the school or program resonated with them and which they formed an emotional connection to. Often this was a positive experience relating to personal values, beliefs or which triggered memories.

> *"We're called the storytelling lab. It just, I don't know, just everything just fell into place really well and I think it was the compassion that my supervisor has and kindness was a big thing."*

> *"As soon as I switched it was just like everything good so easy, and it was the right path, and I was just instantly gratified and happy with my work."*

> *"I always, maybe, had some intuitive sense that this was going to be the angle, but I never really reflected and kind of acknowledged that fact, and it was very, very difficult to kind of understand my feelings towards it."*

> *"But I think now it's clear as day that yeah, like, hey, I'm doing this because I'm interested in it. And I can do a lot of good. And like that is awesome. Because that's basically in my eyes, the 2 major check marks for feeling or feeling fulfilled right? And that's all I really want is to be fulfilled. So, it was a very gradual process, I'd say for me. Though the intuition was kind of leading my decisions, I didn't know why I was making the decisions I was."*

> *"So, how studies have then seemed like a good entry way into medicine. Which was all good and fine, except I feel like the program description wasn't entirely transparent about what it actually was so. The first 2 years were some of the more traditional sciences, and then the second tiers are really all about research methods. So, it kind of like slowly wormed its way into my subconscious--that, like maybe it's not medicine I want."*

For others it was grounded in feelings of hurt or betrayal and motivated by anger or a sense of justice.

> *"It wasn't until I was maybe 20, my mid-20s. And the decision came as a result of, like, betrayal."*

> *"You have this really deep pain, that historical trauma, but we're able to transform that into something that's so good, and fuel us to move forward and reclaim our or our ways of being in that way."*

> *"We were never supposed to be here, we were never meant to be in higher education, they didn't plan for us to be here. And so, that's what kind of like, spurred me to go further."*

> *"My PhD is definitely going to give me that, you know, when you have a weapon… It's going to arm me with the knowledge that awareness, the humility and the courage to basically step forward for all our Indigenous young people, we need to have that voice."*

Those who spoke of an alignment with personal strengths or values seemed to emphasize a need to engage in the Canadian economy in a way that didn't sacrifice or give up who they are as Indigenous people.

> *"I have a neurodegenerative disease, which also prompted me to… It also informed my decision to go into research-based things."*

5.5.4 The Residential School System and Sense of Belonging

The results of a hierarchical logistic regression presented in Table 4.9 show that residential school survivors and their family members are significantly less likely to pursue a university education than other postsecondary credentials. The effect of these schools on university attainment rates is most pronounced in residential school survivors, and the magnitude of this effect decreases relative to the proximity of the respondent to the family member who attended.

> *"My mom and dad were forced to attend [name of school] Indian residential school in [city] and so that was my aunties and uncles and my grandparents were forced to attend the residential school as well, and so there are many people still dealing with those that intergenerational trauma that they experienced."*

> *"In our community, we've been affected by colonialism and disenfranchisement in this business simulation, and we use these big words because we're trying to theorize this understanding that's very, you know, specific to academia and we forget that sometimes we just got to say like you know residential schools really influenced us on our trauma. And that trauma of not having access to culture*

and language also affects our learning spirit and because we've been robbed of so much thing that's why we suffer academically that's why we suffer socially and you know, and that is a community-based thing it's not just the community in terms of being on reserve but it's community of being in our institutions is in our workplaces. And it's a ripple effect."

5.5.4.1 Intergenerational Trauma and Ongoing Violence

> *"Foster care is the new residential school system, and suicide is the new genocide."*
>
> – Mumilaaq Qaqqaq (2021)

Over 90% of participants who shared their experiences with residential schools had a family member who attended and 83% had at least one immediate family member (either a parent or grandparent) who attended. Not surprisingly, intergenerational trauma emerged as a core theme throughout the analysis. The more significant themes within this dimension include struggles with and exposure to addictions, poverty, child welfare and suicide.

"My grandparents were affected, my aunties were affected, my mom was affected, my children are affected by it, I'm affected by it, you know what I had to heal in order to try to help these… help my family."

"You're seeing the survivors, you're seeing their children, you're seeing their grandchildren live through these atrocious these… of what should have been a happy home."

"She was also in a family with all alcoholics. She lost her mother when she was like six. And then she had a stepmother and that actually hurt her was found beaten and abandoned in the snow and died. And I think how to how does like a teenager understand that? You know?"

"I wasn't a very healthy person before coming to corrections. I've actually been on a healing journey for 14 years. Alcohol was a big part of my life way back when."

"I think also my parents didn't necessarily also provide like positive experience of Indigenous people, but that's also maybe your reflection of what they were seeing but also I think my parents have I put this on, they saw my mother intoxicated a lot."

"In my family, alcohol, alcoholism started with my grandfather."

"Traditionally, we're basket makers and that ended with my grandfather. He sold all of his tools for alcohol. So that's another aspect that I'm trying to reclaim."

"I had a problem, but this past summer I'll be seven years sober and my whole world just opened up after I made that choice, the best choice I've ever made in my life."

Over half of all children in foster care in Canada are Indigenous. These children are more likely to be incarcerated, suffer from low self-esteem, depression, panic attacks, suicidal tendencies and PTSD. They are more likely to struggle with substance abuse issues, have poorer health and earn less money. Even when income is controlled for, the mental, emotional and physical behaviours remain.

"I didn't really understand what I always thought it was… what is wrong with me, you know, why do I have these feelings of insecurity and inferiority. And as I told you, I was in foster care and a lot of that came from that experience."

"we're sitting alongside the road hoping apple will fall out, so we can eat I'm like what happened, like how did we get kicked out of the driver's seat and why is it that we don't have anything to feed our families and why are we in jails, and why are we in foster care and you'll… Why, why, why?"

Suicide rates amongst Indigenous peoples in Canada are anywhere from 2-9 times that of the general population after controlling for other determinants such as mental health. As such, most Indigenous peoples have been directly affected by this, including participants in this study.

"A lot of our people who think about suicide, who are who are who feel like mental health is a huge concern that they can actually go back to the land, so what are those innovative."

"The reason I was failing, it was it just you know I had to deal with you know suicide loss in my family."

"And so, these boys contact us still and let us know how their lives are going. And one of them, unfortunately, hung himself with his brother on a tree. But the other boys are doing really well."

The impacts of the RSS and the trauma that participants are navigating was not confined to a specific area. Rather, it seemed to permeate all aspects of their lives.

"My path not graduating high school living as a homeless youth all of these types of things are actually like really tied to our intergenerational trauma."

"it's all about, like, how intergenerational trauma has like influenced our ability to navigate our lives because there's just so much… like the trauma persists throughout generations, and then it comes to a point of like being adults and still feeling this intergenerational trauma."

"The Kamloops uncovering, because you know, what actually brought a whole it, it brought out the, how Canada was able to, you know, survive in the West. And basically, they use residential schools and basically took all the children from the land and, you know, then you're basically left with a lot of broken people, and a lot of people that depend on drugs and alcohol."

Most often, however, participants spoke of their personal healing journeys and maintaining balance through culture and connection (H.5.3.2).

"We have to go into those dark corners and then you're going to feel better, even though you know it feels very raw and painful to do so. I don't think I wouldn't be the same person if I hadn't done that."

Many of the stories of healing shared described how they learned to lean on their sacred medicines, traditional ceremonies and how they were able to draw strength and support from their community. Importantly, many actively practiced traditional healing or land-based healing to maintain balance and improve their overall wellbeing throughout their studies. For some, reconnecting to culture was also described as a form of healing.

"I get up early get to smudge I get to start my routine and it's always the same routine"

"I really believe that and do ceremony whenever you can and practice using your medicines. It's just as I think being on the land is important."

"And like [participant] said, the ways that you rebalance is you, I love water. So, I live close to the Humber and I'm out there like regularly and every weekend to go and like, hang out with the salmon that we're running recently to, to listen to the water to sing, you know, the Lake Ontario is close by so I can go there and just sit and just be."

"Once we got into it was very therapeutic, you know, the… I think we're doing the eagle feather. Just beading the eagle feather and so, once we got into those very therapeutic."

"If I'm ever at an event where we start with a smudge, I feel grounded. I feel calm. I feel like it just helps me come in, to come to where I am, you know, my mind's not a million miles away."

"I'm taking my research, a little bit further and looking how language revitalization and language ties with mental health and wellbeing of community."

"I'm hoping that by talking about the land and describing what it means to be on the land that we were able to connect to it spiritually and find that there is healing on the land so rather than prescribe pills beyond pills, that we can find healing for a lot of people on the land, going back to our traditions from our [] from what our ancestors have lived and I can only talk about some what our ancestors I live."

"We had to heal ourselves and what, how do you do that, you know, you go back into ceremony learn your language you find, you know, Indigenous mentors in your community you find those Elders you find those people that want the same dreams as you."

"I do some residential school training as well, so I'm gonna take a look at the teachings that… [Nation] people lost their language they weren't able to... they weren't able to speak their language and were punished for speaking their language. And so, the trauma that happens from not only not being able to speak your language but not being able to think in your language know there's a psychological trauma that happens as a result, and so it's going back to the languages and coming back to the teachings that really."

5.5.4.2 Perceptions of Public Institutions and Colonial Systems

Sect. 2.1 and A.5.4 discuss the weaponization of the educational system in Canada to eradicate Indigenous culture and how it resulted in the alienation of Indigenous peoples from the education system and led to a deep seeded distrust of all public institutions, especially educational and research institutions.

"They were even involved in some of the experiments with First Nations kids, and residential schools, all the nutrition, there were their medical experiments, there were dental experiments, surgeries performed without anaesthetics. I'm amazed to see how little they could feed kids. Like studies on the human body, and a lot of that came from [university]."

Restoule et al. (2013) published a study on barriers to PSE faced by Indigenous students in Ontario, Canada. Their survey results showed that, amongst postsecondary graduates, 57% reported that they did not trust the education system (Restoule et al., 2013). This distrust often manifested as a hypervigilance towards racism, assimilation or appropriation. The present study finds examples of distrust towards work colleagues, educators, peers, researchers, as well as the systems in which they operate. Participants often shared how

they constantly expect to be exploited and robbed and needed to always be on guard to protect cultural knowledge.

> "[…] *others that are like, don't share our knowledge, because it will be exploited."*
>
> *"I just worry that these sorts of things are going to be exploited, just like everything else."*
>
> *"I get conflicting sort of responses from my Elders or people that have come before me. In terms of, you know, what's appropriate to share within the institution. When it is appropriate."*
>
> *"If Big Pharma got a hold of it, you know, we were gonna keep those because, you know, if they got word that you know, they're losing customers or profit over this one, you know, root in the ground that can where they can be found, you know, it'll leave us."*
>
> *"There's been some talk about distrust, and I learned that the hard way as well, there's a lot of distrust. I've had to learn to be somewhat distrustful, especially when it comes to my research, because other people will steal it and run with it. And I've had that happen."*

Distrust is a common theme amongst all participants to varying degrees and appeared to the result of lived experiences throughout their lives. These negative experiences persisted over the course of their studies which reinforced distrustful predispositions.

> *"Some of us don't trust the structures that are here. The laws, the justice system, the policing, the education system, the health care system, like every single major factor and place in Western society is… it has been really bad for Indigenous people."*
>
> *"I'm still dealing with it like it's certainly damaged my view of... or my relationship with the university."*
>
> *"I just felt like I started trusting the system and started trusting the colonial system. And that was a good kick in the ass. So that brought me back to square one. Do not trust anyone. And so that's where I'm at today."*

Many students expressed how they held negative perceptions of university when they started their programs (H.5.3.1). Universities were most often viewed as exclusionary, or places where they were not welcome or that were not built for them. *"So I went to university, which was a jail of its own, but at least I had some freedom."* Often their perceptions were validated through what they felt were performative actions by the

university and lacking any meaningful change to make these spaces more welcoming, supportive or inclusive. Several mentioned that their universities had not made any substantial progress towards the TRC calls to action and efforts were considered to be tokenizing or disingenuous.

> *"We have all of these universities across Turtle Island that are checking boxes off the Truth and Reconciliation commissions calls to action and, like making it look like they're doing a good job."*

> *"I'm not going to burn out just to, like, so the institution can put their check mark that, oh, yes, we have a knowledge keeper/counsellor on staff, and we're using them, their knowledge, and they're supporting everybody, but at their own expense."*

> *"I said I never ever in my whole life want to do a PhD because I'd heard horror stories about them. And then anybody I knew that ever got a PhD was mostly a few so nothing against you guys, but no, I think the [university] has some pretty horrific horror stories."*

For some, attending university was a way for them to reclaim their power, confront their abusers, and fight back against systems of oppression and marginalization.

> *"I'm looking at that teacher that struck him and said, there's no way that your treatment of my dad is going to stop us from sharing our language and picking that language up, because you that action is going to only make it more important and, and fuel my journey to becoming fluent."*

> *"I think that's kind of like where the master's degree helped me to learn. After four years of asking questions, I realized that I was talking with the spirit of colonization. Why don't we have our languages? Why don't they like us? Why? Why? Why? Right? And then answering those questions in my dissertation, from my perspective as Anishinaabe."*

5.5.4.3 Cultural Dissonance, Sense of Belonging & Experiences of Racism

> *"We were never supposed to be here. We were never meant to be in higher education. They didn't plan for us to be here."*

The two sense of belonging variables included in Model 3.4, "Sense of belonging to culture" and "Sense of belonging to Canada" are both significant predictors of university attainment though both are unreliable due to increased variability in the sampling error. As described in Sect. 4.6.3, sense of belonging is complex and multifaceted and not easily quantifiable nor fully captured through just five Likert-style questions in the middle of a 90-minute survey (Knekta et al., 2020). Given the abundance of literature indicating the

significance of Indigenous students' sense of belonging within postsecondary environments (Pidgeon et al., 2014; Verde, 2019) and its connection to the RSS (*RCAP*, 1996b), I decided that it was deserving of further examination.

Several participants expressed a need to embrace a two-eyed seeing approach. This goes beyond honouring the strengths of both Indigenous and Western knowledges and ways of knowing. It requires us to create spaces for everyone to co-exist while maintaining the integrity of our identities and voices, and committing to principles of reciprocity, mutual accountability and co-learning.

> *"What I think the future of all academia is, Etuaptmumk. Two-eyed Seeing, I feel like there is a missing approach there. I think that the approach could be an Etuaptmumk approach."*

Others felt undervalued, noting the institution's commitment to the superiority of mainstream epistemologies prevalent in academia and which undermine and devalue Indigenous knowledges and ways of knowing.

> *"I'm in my master's program…which is environmental science and applied management. I, as an Indigenous researcher have had some difficulty with that program because of bias of Indigenous knowledge not being as important as Western science. I'm being told often that that isn't science, and I've actually been questioned of where my place is within the program. Because of that, I'm in my third year of the program, it's really sent me back an entire year. But during that time, I've been following Indigenous methodologies of becoming the best researcher I can be before heading out into my own research."*

Many, however, were determined to overcome these barriers by staying true to themselves and their identities. This presents challenges because there are few qualified to supervise these efforts and their research doesn't fit neatly into institutional policies and processes tailor made for a different approach and which evolved in a system designed to exclude and discredit alternative approaches (H.5.3.4).

> *"So, it's not that I'm going to fit into the program. It's whether the program is going to allow me to utilize and structure my Indigenous, way of being in a way that doesn't change who I am."*

Honouring tradition and respecting cultural protocols often add a layer of relationship building on top of research which takes time. Indigenous research projects are also subject to additional ethics and legislative requirements which can be difficult to navigate, even for an Indigenous student conducting research in their own community.

"Wanting to be completely respectful to these models, it's, in some ways, like Indigenous research takes a longer period of time because of relationship building."

"They're working really hard to keep it to follow the traditions and cultures as a part of their programs."

"I was also blown away by how it was written by two Indigenous people in a conversational style using plain language and how they would talk. And that was in a journal article. And I feel like that was a really innovative piece. But it also gives me hope for academics to become more accessible."

Students rarely felt that these were safe spaces welcoming of Indigenous ways of knowing, being and doing (H.5.3.4). Many felt that they had to hide or repress their Indigeneity in these spaces or that they needed to leave that part of themselves at home when they pursue a university education. They sometimes describe having to disguise their true selves to fit in which creates barriers to authentic expression, connection and belonging (H.5.3.4).

"You have to have discernment when you go into spaces you can't just share too much of yourself, and you also have to just be aware of where you are."

"I just felt like I wasn't being my authentic self. And I was going to drop out. Because I just didn't feel like I could be myself be passionate about what I'm passionate about."

Understandably, few students felt comfortable expressing their culture and identity in these spaces. Experiences of racism are regularly cited in the literature as one of the most significant factors contributing to low university completion rates amongst Indigenous students (Archibald & Bowman, 1995; D. A. Clark et al., 2014; Pidgeon et al., 2014). These experiences often start in early childhood and persist throughout their educational journeys. They are rooted in the legacies of colonialism, social exclusion, and cultural genocide and act to validate previously held perceptions of university. Experiences of racism on campus are described as impacting not just their sense of belonging, but also their sense of self-worth and self-efficacy.

"I had one prof tell me [that] I was never going to make it through to the end of my master's that I might as well quit. Another one, [former Department Chair], told me that I might as well drop out now, because failing out of the program was inevitable."

"Someone said to me, as we were going to an Indigenous person in distress, why would Trudeau launch a national inquiry into missing and murdered aboriginal women when all their drug addicts and

alcoholics. And I got quiet. If I just hide it... From that point, I was going to hide who I was and not tell anybody."

These experiences can present in any number of ways. Often they take the form of microaggressions where they overhear remarks implying that Indigenous students are less qualified or deserving to be there (Clark et al., 2014). The stories we heard shared striking similarities to those described in papers published decades ago and thousands of kilometres away.

"I started thinking that way because of other Indigenous students saying how they didn't want to be token and then I got thinking, oh no! Am I? Is this why I got this position? Not thinking that my marks were good enough to get into a master's program."

5.5.4.4 Self-perception

Indigenous peoples in Canada have a long history of institutionalized racism often centred around false claims of inferiority. This is combined with racial oppression, forced economic dependence, being treated as wards of the state, social isolation, and cultural genocide through schools that sought to "kill the Indian in the child" by systematically shaming them into adopting White Christian beliefs. They were taught from as young as three years old that their ways of knowing, being and doing were uncivilized and if they wanted to be included in society, they needed to learn how not to be Indigenous (H.5.3.4).

"So, in terms of like, being proud of where I came from and stuff like that. It's hard because there is a lot of trauma there."

Self-perception consists of all references to a sense of worth, confidence or efficacy as they pertain to either oneself, culture or identity and within the context of decisions to pursue or complete a university degree. A sentiment analysis reveals that roughly 55% of the references are negative and roughly equally very or moderately negative. The remaining 45% is positive and mostly concentrated in the moderately positive. One major theme in the data also relates to self-efficacy and students having to overcome the feeling that they are somehow not good enough for university.

"I never felt ashamed of where I came from until I went into the workplace. And then it was other like non-Indigenous people's opinions of what Indigenous people are or look like, that made me feel shame."

Self-perception is also described as a barrier amongst participants, many of whom have been made to feel inferior by authority figures in educational settings. This sustained abuse continues to have profound effects on communities and feelings of self-efficacy and self-worth.

> *"I was told that I wouldn't be successful, kind of, was told throughout my life. Like people are surprised I wasn't pregnant or had no kids. I have a big family, like I have five brothers, and we all have different dads… And anyway… Um, so I failed out. And I started working at Tim Hortons."*

5.5.4.5 Reclaiming Culture and Identity

Several participants were raised in their home communities and grew up with their culture teachings and traditions. Over the years they developed longstanding relationships with local Elders and Knowledge Keepers and strong dependable support systems. Sadly, however, most grew up disconnected from their cultures and communities as a result of centuries of disenfranchisement, dispossession and ongoing violences committed against them and their families at the hands of Canadian governments. These individuals are all working to reclaim what was stolen from them, including their identities as Indigenous people (H.5.3.3).

> *"Many of my family, or I mean the bulk of them, pretty much lied to deny their heritage, so there's no paper trail. They denied it so they wouldn't have to go to the residential schools."*

> *"Coming across this website, this web page, an Indian Affairs web page, talking about John MacDonald, and how he got voted in as Prime Minister, the first prime minister, with his assimilationist platform. And, and it just dawned on me, like reading this article that this person is the reason that I didn't know my culture, or my language, or my spirituality. And I just felt like an abject betrayal."*

> *"I'm a 60 Scoop survivor. You may have noticed I'm white. I'm not really a Mohawk, but I look white. So, I was taken because I look white, I have [#] brothers and sisters, I have a brother that's [years] older than I am and, we have the exact same face, all of us. But, um, my skin is much lighter, my hair is much lighter, so they took me but no one else."*

Universities in particular are often perceived as fundamentally incompatible with Indigenous culture and ways of knowing being and doing. And for a population that is struggling to reconnect with a culture and lifestyle that was taken from them and their communities, attending university can feel like a step in the wrong direction.

"So, like in the back of your mind you know that you're trading your… It's time for secondary or for those experiences. And sometimes that really hurts because you realize that you're trading in, like, part of… You're trading in a bit of your culture to even be here in the first place."

Participants often spoke of reclaiming their identities as a lonely and isolating experience. Some had developed peer networks and systems of allies and mentors to guide them, though most had to find their own way.

"I'm working through a lot of stuff and trying to figure out, you know… What does it mean to be Indigenous to me? You know?"

"I'm trying to reclaim who I am as an Indigenous person, but I'm finding out more about myself as my own research takes place, because my research is connected to, basically, being within our circles—in our safe spaces [on campus]. So that is definitely a bonus in regard to what's going to come out of my research."

"We were told what it looks like to be in business. We're told what being Indigenous is supposed to look like. And it's like, why are people who are not Indigenous telling us what it's supposed to look like?"

Loss of identity is a common theme in our discussions on the intergenerational effects of the residential school system. This has left many feeling as though they are somehow "less Indigenous" or haven't earned the right to claim that they are Indigenous.

"I try to stay connected with other Indigenous people. I think it's a little bit more difficult to… When you were like in a foster care situation your whole life, you know. I don't feel… Like I never say that I'm from that particular community, because I never grew up there. I've been there, but I don't say I'm from there because I'm not. That's how I feel."

Further complicating this issue are varied perspectives on what it means to be Indigenous and frequent changes in policies and processes seeking to affirm claims of Indigeneity. One study found that only half of the Indigenous students in their sample would identify as Indigenous on their university application. When probed, these students cited privacy issues, distrust of governments or that they would be rejected (Restoule et al., 2013). Over ten years later and Indigenous students are still choosing not to identify as Indigenous on their university applications. Students today must contend with the popularization of Indigenous identity politics and with it, increased scrutiny, narrower definitions and higher standards of

proof. As one participant explains, they were not eligible to receive cultural supports until changes were made to the legislation in 2016.

> *"Because of the Indian Act, there was never a box for Non-Status First Nations until 2016. I think it was… I started my BA in 2014, so I didn't have any Indigenous supports."*

In Ontario, for example, students apply to universities through the Ontario Universities' Application Centre website. Applicants are presented with an option to self-identify as Indigenous by checking a box and are later asked to prove their Indigenous status by providing documentation. Acceptable documentation can be either a Canadian Certificate of Indian Status, a Secure Certificate of Indian Status card, or a Band membership card. Importantly, these documents do not apply to many legally recognized Indigenous peoples including all Metis peoples and some Non-Status First Nations in addition to all those who have been displaced and are still finding their way home. On the document uploads page, another statement reads, "Do not upload any documents that are not on this list, as we will not process them or send them to the universities" (N.A., 2025d). While the documents are not mandatory, the presentation of an exhaustive list of proofs often results in students choosing not to identify and implies that the schools being applied to will not consider them to be Indigenous if they don't have this documentation or aren't comfortable providing it.

Indigenous identity is a complex and nuanced topic and reclaiming it is becoming increasingly challenging amongst those who have been historically disenfranchised or estranged from their families, Nations and communities. Widespread reports of Indigenous identity fraud in the media have sparked outrage amongst Indigenous peoples, many of whom have grown increasingly distrustful and calling for narrower definitions and more rigorous affirmation processes.

> *"I grew up as an urban Indigenous… and we all know those contentions in regard to, even within our own people… The lateral violence, like you're not Indigenous enough."*

5.5.4.6 The Cultural Support Systems

Participants frequently cited the importance of cultural support systems in feeling validated, giving meaning to their studies, maintaining balance, healing and reconnecting to their culture and identities. It was in these places where participants most often received affirmation from other community members and which they describe as helping them to find themselves.

"I feel like I'm on a path and I'm closer to doing what I meant to be doing. And that, when I'm doing what I'm meant to be doing that I can have confidence in that it's not just me that there's this whole spiritual network and ancestors and clan roles and responsibilities and all this other stuff that's like holding me up"

"I loved being in a room where everyone was Indigenous and I was accepted as being Indigenous."

Participants received cultural supports from a variety of sources including local reserves and service centres, peer support networks, informal communities on campus and university-funded programs and services. Reports on the availability of these supports while attending university were, however, mixed. Some expressed ample support on campus while others were forced to seek support externally.

"There are definitely some folks who are, like, really important in my life and who, like, give me a little bit more, like, feeling of significance, but I don't find a lot of that feeling within the university, I find it outside."

Others felt frustrated by the lack of local and community support systems, *"I shouldn't have to go to university to learn how to speak Cree"* and relied almost exclusively on cultural programs provided by the university.

"I would say the support network… Not only do we have regular check-ins, as a group—that's initiated by our supervisor—then we have the postdocs that have different talents that help us out when we need them."

"I think through [Elder-in-residence], she's helped us a ton, you know. She's really been the driving force behind my reconnection. There was always a part of me yearning to reconnect, but it was just difficult in the environment."

Sadly, there were also some who were unable to find support and had to teach themselves by either researching or through peer networks which tend to form organically.

"I've had to go out and look and learn how to smudge and go into my own sweat lodges and go to the Pow Wow, so I've really had to kind of sort that side of my cultural identity out on my own."

"There really aren't any opportunities for language teachers or language advocates or language programs. People learn from work to get support from one another."

The availability of cultural supports does not appear as pronounced in decisions to pursue a university education as the literature suggests (Table 4.3). Instead, those pursuing degrees are often found using their education to reconnect with their culture and pursue programs that facilitate this.

"I kind of used this degree to like further my own knowledge like that... It really spurred me to learn about Cree language and my heritage. So, I kind of used it."

"I'm exploring culture in, by means of academic literature, but on Indigenous methodologies so, like, I'm learning lots about culture and how that influences research."

"From sun-up to sun-down, I'm immersed in Cree, the Cree readings, the Cree writings the three projects I've got Cree projects going on right now and Saskatchewan and it's just such a gift to be able to work in the language."

"I had very little influence from my family on the Indigenous side, aside from my grandparents, really. And so that was actually proved to be quite tricky because they were reconnecting, and then I was also reconnecting with my Indigenous ancestry, and for me, that happened mainly at university."

"There are Indigenous features in engineering which are specific to engineering. So basically, through these programs and meeting these people. It's been, probably that was the best kind of cultivator of connection, and it helped us kind of as a group grow together and individually."

"It was also like a healing journey for me, especially in the master's program, being able to do, like, ceremony and included as a valid source of knowledge. And to be able to use that in an adopted and document my learning that way."

5.6 Theoretical Mapping

This section seeks to distil findings into a series of actionable focus areas by mapping observations onto the frame of reference presented in Table 4.2. All of the themes emerging from the directed content analysis described in Sect. 5.4 and expressed as factor dimensions in Table 5.2 are classified as either affecting access to PSE or preferences in pursuing PSE.

When classified as either a factor affecting access to university education or preferences in pursuing a degree, only 10% of all references relate to access factors and they were almost exclusively barriers as opposed to enablers. Among the access factors identified are access to capital, the financial and non-

financial costs of PSE to the participants as well as their families and communities, community obligations preventing them from going, and factors relating to intergenerational trauma such as experiences with child welfare, addictions and suicide. In some cases, mixed findings led to factors being classified as both an access and preference factor. For example, community obligations were a significant barrier for many but was just as often described as the students' motivation. The sense of duty that students felt to help or better their communities is one of the central themes that emerged in the analysis. Students who overcame this barrier often feel they owe a debt to their communities and drives them to find ways to use their education to better their communities or to pave a path for the next generation. Other preference factors relate largely to intergenerational trauma, perceptions of university, widespread distrust of public institutions and employees of those institutions, lack of exposure to university or role models in their home communities, experiences of racism, self-perception and disconnection from culture and Indigenous identity.

Table 5.3: Factors affecting access to and preferences in pursuing PSE.

	Access	Preferences
Positive	**Enablers**	**Motivators**
	• Family & Community Support • Funding Programs • Allies & Mentors	• Wanting to Help Community ◦ Community obligations ◦ Paving a path for future generations • Heart & Spirit ◦ Experiences of racism • Personal Interest & Purpose ◦ Language revitalization ◦ Cultural preservation/revival ◦ Decolonizing the academy • Allies & Mentors ◦ Parental influence ◦ Employment opportunities
Negative	**Barriers**	**Demotivators**
	• Access to Capital ◦ Underfunding on-reserve ed. ◦ Tracking to remedial programs ◦ Band funding programs • Geographical Barriers • Community Obligations • Access to Information ◦ Role models in community ◦ First-generation learners • Intergenerational Trauma ◦ Child welfare, Addictions, & Suicide	• Self-perception • Experiences of Racism • Intergenerational Trauma ◦ Loss of culture & identity • Distrust of Public Institutions ◦ Perceptions of university • Cultural Differences ◦ Imposter syndrome ◦ Incompatible worldview ◦ Sense of belonging ◦ Indigenous representation on campus

Source: Author's analysis using author-collected data (REB Ref.# 2021-108).

With the help of a sentiment analysis, factor dimensions are further classified as either positively or negatively influencing these decisions and grouped by aggregate themes informed by factors from the literature review in Sect. 4.3. Many positive factors centred around what they seemed to feel was their duty to dismantle exclusionary systems and pave a path for future generations. Participants expressed the value of Indigenous role models within the institution as well as non-Indigenous allies. In almost all cases these supports have been instrumental in their successful completion of the program. Like access and preference classifications, mixed findings sometimes led to factors or dimensions being listed as having both a positive and negative impact. For example, cultural differences often manifested as students feeling like imposters or that they don't belong and was described as a demotivator. In other cases, students described it as a key driver of their decision to pursue university and as giving them purpose to decolonize the academy. Additionally, the nature of the impact of other factors such as role models, mentors and allies vary amongst participants depending on personal experiences. Those who have a supportive community or a mentor to guide them describe it very differently than others less fortunate. Lastly, some of the deep-seeded systemic factors such as intergenerational trauma, loss of culture and identity, and experiences of racism permeate many aspects of life and impact decisions in a multitude of ways.

5.6.1 Barriers

Barriers are classified as factors that negatively affect access to university education. Based on a review of the literature summarized in Table 4.2, these factors most often include tracking to trade schools and colleges, the proximity of university campuses to Indigenous Nations and communities, ongoing responsibilities to families and communities, access to capital and underfunding of schools on reserve.

A number of barriers are highlighted in our interviews with access to capital, lack of information and role models in communities, and intergenerational trauma being most pronounced. Access to capital was often described as a significant barrier for not just them, but the entire community and the result of underfunding from the government. Underfunding is found to affect educational attainment in several ways and has implications on both access and preference factors. It starts with the underfunding of on-reserve schooling which tracks students to lower levels of PSE by limiting their options and persists into postsecondary through caps placed on band funding programs further limiting options to less expensive programs located closer to communities. Geographical barriers are often found to interact with ongoing obligations to family and community. *"I strategically chose courses that were on Tuesdays and Thursdays, so my family would only have to commute on Tuesdays and Thursdays."* Those residing in rural communities are more affected by geographical barriers and its constituent themes.

One of the most significant barriers found relates to access to information in participants who were raised in smaller rural communities lacking university graduates and positive role models. Rarely do they report having received adequate guidance and in some cases their families and communities actively discourage PSE. These barriers are not just a problem for students, but also in forming research partnerships with communities who are already justifiably distrustful of these institutions and their intentions.

Lastly, intergenerational trauma resulting from historic and ongoing violence against Indigenous peoples manifests in a number of ways that directly affect access to university education. These include, among others, struggles with and exposure to addictions, poverty, child welfare and suicide. Those suffering the effects of intergenerational trauma are also found to expend additional energy throughout their studies in the form of confronting their abusers, reliving their trauma, and engaging in personal healing and wellness activities.

5.6.2 Enablers

For all intents and purposes, enablers are the opposite of barriers in the frame of reference. While they are both access factors, barriers prevent access while enablers enable access. In many cases enablers emerge in response to barriers and as such many of the same factors appear in both. For example, while home communities can create barriers to university, they are also among the most profound enablers. Many participants come from communities with ample access to mentors and role models, some of whom have degree holders in the family. The impact of Indigenous mentors, role models and family members on decisions to pursue PSE is immeasurable. Even in cases where families or communities know little about PSE, having their support can make a world of difference.

The proximity of the school to participants' home reserve was described as an enabler amongst those who attend local universities. In some cases, being able to commute to school made university education both accessible and practical. These students describe this not just in terms of cost savings, but also being close to their support systems and traditional territories made it seem less scary. Students would often describe this connection as a source of personal power.

Allies and mentors are critically important to both decisions to pursue university and in retention. The influence of allies and mentors on educational decisions is largely relegated to preference factors, though they also impact accessibility of university programs through the availability of information necessary to make informed decisions. Most participants received at least adequate guidance on PSE and many had family members with university degrees. Importantly, however, all participants reporting inadequate PSE guidance were either Inuit or First Nations.

Funding programs were also described as an enabler in some cases, but more in terms of helping to ensure their success by allowing them to focus their attention on their studies. None of the participants stated or implied that they might have chosen a different path had funding programs not been made available. In fact, few participants were funded and most of those who were received only enough to cover a portion of the fees.

5.6.3 Motivators

Motivators are factors that positively influence the preferences of students to pursue university education. They are composed mainly of reasons and rationalizations in addition to a number of subconscious influencers. These influencers are not the result of cognitive deliberations and, as such, not easily articulated. They are often grounded in formative experiences from participants' childhood or transformational moments throughout their educational journey which manifest as ingrained beliefs of predispositions.

Factors consistent with money-maximizing rational decisions are not found to be significant motivators. In some cases, participants expressed their desire for more rewarding, sustainable, respectable and higher paying positions, but these were largely drowned out by non-financial motivators. Most notably these include a sense of duty to help their community or the broader Indigenous community, finding purpose in it, advocacy and cultivating community, being guided by heart and spirit, positive role models and strong support networks and the intergenerational trauma they carry as a result of the RSS.

While many spoke about intergenerational trauma as a barrier causing delays in both deliberation time and time to completion, just as many described it as a key factor driving their decisions to pursue university and their choice of program. These participants are often deeply committed to language revitalization, cultural revitalization and dismantling systems of exclusion and subjugation. They are also closely related to participants' desire to help their community which are often born from personal hardships and grounded in their desire to pave a path for the next generation of learners or to become the role model that they never had.

Participants frequently cited the importance of cultural support systems in feeling validated, giving meaning to their studies, maintaining balance, healing and reconnecting to their culture and identities. Culture and community are most often where students receive affirmation and are able to draw the strength they need to persevere.

> *"And, you know, I was poor, but we were all poor, and so we all support each other."*

"Access to culture, language is really huge on people being able to, like, feel good enough or, like, find that community that makes them feel good enough."

Many also described previous experiences or industry exposure as a significant positive contributing factor. This was often the result of prior relationships with mentors or allies who provided them with opportunities. The role models that were identified as motivators were almost exclusively Indigenous community members who succeeded in spite of the obstacles they faced. The most influential mentors were university graduates in the family, though even first-generation participants found motivation in being accountable to their families or ancestors and the sense of duty that they felt to better their communities.

5.6.4 Demotivators

Some of the most significant demotivators are the direct consequences of the residential school system. These factors centre around intergenerational trauma and the ongoing effects of social exclusion and institutionalized racism. These include the loss of culture and identity, not feeling safe or a sense of belonging, low self-esteem and self-confidence, experiences of racism, distrust of public institutions and cultural dissonance.

Despite the inaccessibility of capital that many participants faced, the cost of university education as a demotivator is rarely described in monetary terms. Instead, they describe the costs incurred by their families and communities and further disconnection from their cultures.

Participants who struggled with self-perception as a demotivator often described it as a lack of self-confidence or self-efficacy and is closely related to experiences of racism. Many of these experiences were from early childhood by bullies or authority figures in school which caused deep emotional wounds and resurface as feelings of shame and inferiority.

"In grade eight, I was told I would never amount to anything. And basically, I was told that in front of my class, and I could walk you through the entire scenario, but I remember it to this day."

A lack of representation was discussed as a significant demotivator which often cut twice. Once with a lack of university representation in the community and again with a lack of Indigenous representation on campus. Both forms of under-representation act in concert to deepen beliefs that universities are not accepting of Indigenous culture. Further contributing to this is the superiority of mainstream epistemologies in academia that undermine Indigenous knowledge systems and ways of knowing.

5.7 Conclusion

These findings indicate that the proximity of communities to universities, access to capital, underfunding of on-school reserves, and tracking to trade schools and colleges are ongoing interrelated issues preventing access to university education. The costs and benefits of these programs are also discussed, but rarely in monetary terms and never as a weighing of costs and benefits. Costs are most often described as those incurred by loved ones or disconnection from culture and benefits often take the form of helping others, cultural reconnection and revitalization, or forms of self-actualizing or flourishing.

The distribution of references across the factors of interest indicates a strong emphasis on non-financial motivators. This is especially pronounced in the themes relating to the consequences of the residential school system which seemed to permeate all aspects of participants' lives. These include struggles with and exposure to addictions, poverty, child welfare and suicide, and the need for culture-specific resources to support personal healing and cultural reconnection.

Many positive factors driving student decisions and success in university centre around a strong sense of duty to better their community. These often relate to community building, cultural advocacy and resurgence, language revitalization, or paving a path for others by dismantling exclusionary systems. Having Indigenous role models, mentors, and non-Indigenous allies in communities and in universities is found to be instrumental in ensuring student success. Participants frequently cited the importance of cultural support systems in feeling validated, giving meaning to their studies, maintaining balance, healing, and reconnecting to their culture and identities. These spaces most often facilitate affirmation and community building on campus.

Incompatibility of worldviews emerged as a core mechanism shaping Indigenous experiences of belonging in university environments which students often perceive universities as unsafe, unwelcoming, untrustworthy, inauthentic, and exclusionary. In many cases, these develop as predispositions from an early age and are later validated by experiences of racism and the lack of Indigenous representation on campus. This can be especially distressing for students who are trying to fit in while also in the process of reclaiming their identities, managing intergenerational trauma, and overcoming feelings of isolation and insecurity.

> *"I mean we've all heard about imposter syndrome and I kind of feel like sometimes… I feel like I'm not Indigenous enough to say this stuff, you know? So, pair not feeling Indigenous enough and then imposter syndrome. And, like the feeling like you're straddling two worlds."*

5.8 LIMITATIONS

For reasons described in Sect. 5.3, this study is composed almost exclusively of graduate students enrolled in major universities across Canada which presents limitations and introduces bias. For example, decisions to pursue a university education over other postsecondary programs or joining the labour force directly happens long before the decisions to pursue a graduate program. This is expected to bias some findings towards more purposeful, intentional and informed decisions. Notably, these earlier educational pursuits and experiences are where educational and career paths are initially plotted/formed.

Despite best efforts to sample match and frame the current findings in the context of earlier results and conclusions, this sample excludes those whose highest level of education is a trade certificate or college diploma and is therefore not representative of the entire population of off-reserve Indigenous postsecondary graduates. For this reason, the present study is also not well suited to understanding why Indigenous students decide not to pursue university. Lastly, the timing of the data collection when unmarked graves were being uncovered will also bias the data towards the impacts of the residential school system. Further contributing to this is an over-representation of First Nations participants who were the target of these and other systems of assimilation and disenfranchisement.

6 Conclusions and Implications

University education provides a level of utility to all those who attend, and I find no evidence that this is any different for Indigenous students in Canada nor that their decisions are inconsistent with the principles of rational utility-maximizing actors. I also find no evidence suggesting that the wage gap or differences in returns to education are the cause of educational disparities. I do, however, find ample evidence to reject the assumption that the financial benefits of university education are an accurate or appropriate reflection of the utility they provide. In fact, attempts to monetise the utility that Indigenous students derive from university programs would be wholly inappropriate and in no way comparable to their non-Indigenous peers.

The utility that universities provide to Indigenous students include such things as confronting their abusers; self-determination and independence; becoming a voice for their people; dismantling systems of exclusion and subjugation; paving a path for the next generation of learners; helping their communities; reviving dying languages; honouring the sacrifices of their ancestors; protecting age-old teachings and traditions; preserving their way of life; breaking cycles of poverty and addiction; becoming the positive role model that they never had; …

These things are priceless. And the price they pay for their degree costs more than money.

For some, it means having to face historical and ongoing colonial violences; enduring social isolation, rejection and experiences of racism; feeling different and unwelcomed; sacrificing sense of belonging; suppressing expressions of culture and identity; further disconnection from their lands, communities and cultures; …

- It takes *bravery* to leave the safety of their Nations to live in foreign cities.
- It takes *love* to build communities in institutions where they were never meant to belong.
- It takes *honesty* to "right the story" and stop the spread of misinformation.
- It takes *respect* to see the world through two eyes.
- It takes *truth* to express their reclaimed identities.
- It takes *wisdom* to transform pain into purpose.
- It takes *humility* to heal from traumas that were never theirs to carry.

To assume that decisions to pursue an education in the system that once promised prosperity and peaceful coexistence and was later used as a weapon to eradicate their culture can be reduced to an estimate of its monetary equivalent is naive.

To consider irrational the decisions of those who choose not to attend the same institutions that tortured their ancestors in the name of research, and systematically debased and discredited their knowledges and perspectives simply because their experiences of utility differ from an economic standard born to optimize hedonistic pleasure-seeking in a foreign and fundamentally incompatible society is narrow-minded.

6.1 Results and Findings

The motivation for this thesis is to help reduce educational disparities by developing a more nuanced understanding of the factors contributing to the education gap. Early in this process, I discovered that the education gap is most prominent in university degrees at or above the bachelor level and amongst Status First Nations and Inuit. Contrary to economic thought and the principles of hedonistic rationality, these qualifications provide the highest earnings premiums and these identity groups receive the highest returns to PSE.

I investigated this inconsistency by testing the cornerstone determinants of employment income from two of the most well-established theories of action and decision representing different schools of thought on the relationship between education and employment earnings—human capital theory and signalling theory. Both theories have proven robust in modelling labour market outcomes and lifetime earnings trajectories, both are anchored in assumptions of money-maximizing rationality as a foundational principle and, therefore, both predict that we would observe a reverse education gap with relatively more Indigenous university graduates.

The results of these tests produce estimates which largely mirror those of the general population in significance, magnitude, shape, and sign. I also do not find any intracultural variations in the effects of these factors on employment earnings. I therefore conclude that these theories do not provide an explanation for the education gap. Notwithstanding alternative rational explanations (i.e., Indigenous-specific factors preventing access to PSE), then we must conclude that the gap is the result of student preferences and reject the assumption that financial incentives are driving these decisions.

I then extend my analysis of the 2017 APS to include access and preference factors and limit the scope of the tests to postsecondary graduates where the gap is most pronounced. I find no evidence to support the proposition that Indigenous students pursue university degrees primarily for financial gain. Instead, I find

that the primary motivators for pursuing PSE are either unrelated or negatively related to postgraduation income and the two strongest motivators are the only two of the six reasons that do not impact the returns to PSE. Additionally, those pursuing a PSE because they want to help their community are over twice as likely to earn a university degree and less likely to earn a higher income after graduating. Indigenous students who do not use their own funds to pay for their PSE are less likely to earn a university degree and less likely to earn a higher income after graduating than those who do. I also provide evidence of intergenerational trauma resulting from the RSS in significantly lower rates of education amongst survivors and their descendants.

Drawing on results from the quantitative analysis, I develop a more nuanced and descriptive understanding of the most significant determinants of university education through a directed content analysis of qualitative data gathered from Indigenous university students across Canada. Findings indicate that the proximity of communities to universities, underfunding, and availability of information are directly preventing access to higher education. Incompatibility of worldviews emerged as a core mechanism shaping Indigenous experiences of belonging in university environments which students often perceive as unsafe, unwelcoming, untrustworthy, inauthentic, and exclusionary. Perceptions of university reinforced by experiences of racism are amplified by intergenerational trauma and often manifest as internalized inferiority and negative self-perception.

Positive factors centre around feeling a duty to dismantle exclusionary systems and pave a path for future generations. Students often reference culture, advocacy, and cultivating community as enablers as well as Indigenous cultural resurgence and revitalization as key motivators. Cultural support systems are cited as providing validation and healing, giving meaning to studies, maintaining balance, and facilitating cultural reconnection and community building on campus. Lastly, students describe Indigenous mentors and role models as well as non-Indigenous allies as being instrumental in their success.

In sum, I find no evidence to suggest that we should question rational choice theory nor that Indigenous students are rational utility maximisers. Rather their experiences of utility are different than that of the general population and so too are the means through which they obtain and rationalize it. These findings suggest caution in applying monetised utility values as universal bases for comparison amongst individuals, segments of the population or across cultures. The monetary estimates or expectations of outcomes cannot reliably be treated as proxies for utility except in rare cases where entity exists solely to maximize money. Despite their usefulness in aggregate to predict behaviour in mainstream society, they lack coherence when similarly applied to subgroups with varied backgrounds, histories and cultures.

6.1.1 Social and Theoretical Implications

The value systems and worldviews commonly found in Indigenous and Western societies when combined with historical legacies, social conditions and geographical contexts have traditionally resulted in misaligned interests and opposing ideologies (Braun et al., 2014; Peredo & McLean, 2013). Estimates of the monetary equivalent of the utility derived from a choice or action is often an adequate approximation for mainstream capitalist societies, in aggregate, and robust across a variety of contexts including decisions to pursue different levels of education. However, there is little reason to assume that they would reflect those of individuals who hold distinctly different values, goals and means to achieve those goals; as in the case of Indigenous students pursuing PSE as a tool for self-determination, empowerment, and community wellbeing. As explained by the most influential exponent of utilitarianism, John Stuart Mill, financial incentives should not be assumed to motivate decisions similarly across cultures.

> *"In Political Economy […] empirical laws of human nature are tacitly assumed by English thinkers, which are calculated only for Great Britain and the United States […] Yet, those who know the habits of the Continent of Europe are aware of how apparently small a motive often outweighs the desire of money-getting, even in the operations which have money-getting as their direct object."*
> (Mill, 1974)

Socio-economic pluralism is a framework which rejects a single dominant market-based approach and provides a possible explanation for the empirical inconsistency examined in this thesis. It would suggest that these economic models achieve coherence in aggregate by suppressing pluralism and that principles of equality are operationalized by enforcing that suppression.

6.2 Contributions and Implications

Canada's journey to reconciliation is rooted in building a renewed relationship with Indigenous peoples with the goal of healing the wounds of the past and making reparations. The reconciliation process seeks to lay a foundation for healing, respect, and mutual understanding by honouring Indigenous rights, acknowledging the significance of traditional knowledge and supporting the resurgence of languages and cultural practices. Through this process, Canada aspires to create a more inclusive society that respects and celebrates the rich diversity of Indigenous cultures and contributes to the empowerment and prosperity of Indigenous Nations.

The scope of this thesis is Canada-wide which sets it apart from much of the literature. While there is a breadth of literature focused on better understanding the main drivers of education in Canada, most focus

on comparing Indigenous peoples to the general population or minority groups. Fewer still focus on different groups of Indigenous peoples and specific levels of educational attainment. This thesis can serve multiple purposes for different stakeholders and audiences. It is of interest to current and prospective Indigenous postsecondary students, as well as Indigenous-led businesses, universities, and policy makers. It may help universities to improve how they recruit, retain and Indigenous students both in how they shape their programs and in establishing systems which better ensure that students remain engaged and complete their course of studies. With a more nuanced and descriptive understanding of these students' motivations to pursue different levels of PSE, educational institutions can enhance the value to their offerings by better aligning them with Indigenous definitions of wealth and experiences of utility. The policy implications of this research are rooted in the assumption that the more we know about Indigenous students and their decisions to pursue university programs, the better able we are to deploy resources to enhance educational opportunities and student wellbeing. Several considerations are discussed below with the understanding that all efforts be developed or adapted in partnership with local communities, Indigenous-led organizations, and the students who they intend to serve.

6.2.1 Preference Factors and Motivating Engagement

This research suggests that initiatives seeking to increase Indigenous engagement in university education are likely based on false assumptions that these students prioritize financial incentives and approach educational decisions as investments in their future earning potential. Too often, efforts to Indigenize or decolonize these institutions focus primarily on barriers and enablers (Moodie et al., 2018). These initiatives might seek to reduce costs, mitigate risk and uncertainty, increase earnings premiums, or otherwise increase the expected return to education. While these need to be considered and addressed, many of the systemic issues go much deeper. By not taking a more holistic approach, educational and research institutions neglect the more complex supply-side issues that make these spaces seem foreign to many Indigenous students. In other words, it's not as much about what these institutions need to do more of, as it is about what they need to do differently. *"It's not about money; it's about the system not being accessible."* It's about understanding what these universities are doing that make these spaces unwelcoming to many Indigenous students and making meaningful changes in the way that they operate.

Most Indigenous students who successfully complete university programs base their decision more heavily on non-financial factors which suggests that addressing access factors alone are not sufficient to close the gap in rates of university attainment. Instead, initiatives enabling access to university must be implemented in parallel with those motivating engagement. The volume of access-based initiatives when considering their relative insignificance on student decisions suggests the need for more initiatives which address preference factors and that provide students opportunities to flourish in their own way and on their own

terms. It is recommended that practitioners consider the unique needs and values of Indigenous students when designing supports and that they mitigate inherent biases by doing so alongside those they intend to support. These could include providing access to funding, resources, training, and education, ensuring inclusive and culturally appropriate policies, cultivating relationships and promoting community building, and protecting Indigenous rights and traditional knowledge.

6.2.2 Building and Strengthening Relationships

All Indigenous initiatives should be co-defined and co-created in partnership with Indigenous peoples and through a process which centres the voices and experiences of their intended beneficiaries. This begins by building and strengthening relationships with Indigenous Nations, communities, organizations and individuals, and ends with true trans-cultural collaborations grounded in principles of reciprocity, respect and co-learning. Practitioners are encouraged to consider Two-Eyed Seeing and trans-systemic knowledge systems as a roadmap to establishing mutually beneficial relationships and laying a foundation of trust and relational accountability upon which these relationships can flourish. Lastly, universities should make more concerted and sustained efforts to engage Indigenous youth earlier, before negative perceptions crystalize, and before tracking to remedial programs limit their options. Increasing exposure to educational and professional experiences would likely have a positive effect on student engagement in university. Programs designed to provide Indigenous students opportunities for first-hand real-world knowledge of life as a university student in Canada could effectively counter negative perceptions of university while improving access to information and in a way that is more consistent with Indigenous ways of learning and teaching.

> *"I had never done proper research before—other than typical undergrad work. So that was… it was fun, it was… I just kind of fell into it and then while we were talking, she asked me if I would be interested in doing my masters."*

6.2.3 Geographic Dispersion and Remote Learning Opportunities

Students regularly cite mobility constraints suggesting a need for more university programs that students can access remotely. This is especially true for the Inuit populations in the territories and is likely one of the reasons for the gap in educational attainment rates in more rural Nations. There are only four postsecondary institutions located in the territories servicing 59 Indigenous Nations across almost four million square kilometres. According to the 2017 APS, 77% of Indigenous peoples with a postsecondary credential chose colleges and trades schools over university. This study also finds students' connection to their lands and culture as a source of strength, loss of identity and cultural dissonance, strong community-orientation, and ongoing family and community obligations are significant barriers which greater access to

remote learning opportunities could effectively mitigate. This makes it especially difficult for those living in rural or remote communities to relocate to larger urban centres where universities are most often located. Many of these students would likely be drawn to study at schools located closer to their territories and support systems.

6.2.4 Indigenous Research

History has taught us the harm that "bad science" can cause. Often these efforts are cloaked in methodological rigor but stripped of any ethical or cultural grounding and lack any systems of accountability. Entire communities were pathologized or erased under research methodologies that were once considered valid. Too often Indigenous research is being done on, not with, Indigenous peoples when it should be meaningfully guided by Indigenous voices. Historically, it was often the case where researchers would parachute into communities with a research agenda, collect data that they use to advance their careers and leave the community no better off. More recently, however, universities and research institutions are increasingly using research to empower communities by mobilizing talent and resources to help communities achieve their research goals. In fact, many of the funding agencies in Canada are now highlighting the need for relational accountability and having researchers with lived experience are reflected in adjudication decisions. As a result, many researchers are finding it difficult to publish their work without Indigenous co-authors and hundreds of manuscripts are being warehoused. Several Indigenous-led journals are emerging, and discussions are underway to determine if and how Indigenous publications authored by non-Indigenous researchers could be reviewed or reworked in partnership with Indigenous collaborators. In many cases, this research was undertaken in good faith, and it would be detrimental to dismiss them wholesale without considering pathways for remediation and relational accountability.

6.2.5 Decolonizing the Academy

The ongoing underrepresentation of Indigenous knowledges in the curriculum and systemic tracking of students into remedial programs are reminiscent of the instruments of assimilation designed by the GoC. The educational system in Canada is structured to protect a knowledge monopoly which serves the interests of a narrow class and concentrates power over what constitutes knowledge and who is authorized to produce it. While efforts to decolonize and Indigenize the academy are currently underway, universities in Canada remain grounded in colonial attitudes, principles and structures that undermine Indigenous worldviews, knowledge systems and ways of being (Brunette-Debassige, 2022). These systems manifest as institutional norms making these spaces seem foreign and unwelcoming and creating barriers for students adopting

methods unfamiliar to mainstream academics. Two-eyed seeing and trans-systemic knowledge systems provide potential pathways to enhancing student engagement and supporting diverse student populations.

A central theme in the factor-driven exploration of students wanting to help their home community or the broader Indigenous community amongst university graduates was a profound sense of duty to give back, become the role model that they never had, and to break down systems of exclusion paving a path for the next generation of learners. Giving students the opportunity to break down barriers and give back is a way for them to build social capital, promote Indigenous cultural resurgence and create multi-generational value, all of which are forms of wealth in Hilton's Indigenous economy and Wuttunee's Community Capitalism (Hilton, 2021; Wanda & Wien, 2024).

6.2.6 Cultural Dissonance, Representation, Inclusivity and Belonging

With so many of the most commonly reported barriers to PSE relating to factors that Indigenous students perceive as being unwelcoming or unaccepting, it is important that educational and research institutions take action to make these opportunities desirable. Incompatible worldviews, notions of mainstream superiority, negative perceptions reinforced by racism on campus, cultural dissonance and intergenerational trauma all shape student experiences of safety, self-efficacy, validation, and belonging in university spaces. Indigenous students' sense of belonging in PSE is closely related to their connection to culture and community on campus. *"They don't have a sense of home, or a sense of belonging, or sense of identity in the school system."* Fear of being estranged from their community or losing their Indigenous identity are concerns that many Indigenous students consider before committing to a postsecondary program.

This work suggests that institutions need to be more accepting of alternative ways of knowing as equally valid. This may require a complete transformation in organizational culture. Universities will also need to develop the capacity to evaluate students based on criteria that are appropriate for each student. Recent advancements combined with the growing popularity of trans-systemic knowledge systems approaches may offer avenues for collective learning with personalized experiences and evaluations. Importantly, it also finds that Indigenous spaces and supports on campus are instrumental in community building, belonging, healing, and cultural reconnection leading to increased retention and engagement.

6.3 Final Thought and Future Work

People tend to act in their own self-interests. Those interests can take many forms and, in the majority of cases, can be purchased and are made possible with money and wealth. Though not everyone is included in this majority and to deny socio-economic pluralism is to force assimilation into mainstream capitalist

ideologies. Additionally, not everyone has the same relationship with money. For some it is a reward that provides freedom, opportunities and possibilities, affords luxuries, and buys time. For others, it is something that they need to survive and that they never seem to have enough of no matter how hard they work. This relationship can become complex and nuanced in disadvantaged populations, especially amongst those who are experiencing the effects of forced economic dependence and widespread poverty (Gagné & Danieli, 1998; Ojha, 2003). Canadians today live in the age of consumerism where money can buy almost anything they value and in a country with among the highest ranked qualities of life; and where many Indigenous peoples are still in survival from centuries of cultural and utilitarian genocide with a quality of life similar to that in developing nations (Carr-Stewart et al., 2013).

Ultimately, more theory-driven approaches capable of capturing the unique circumstances and histories of Indigenous peoples in Canada are needed to reconcile differences in Indigenous experiences of utility, definitions of wealth, relationships with money, and expressions of culture and identity in mainstream capitalist societies. While differences amongst Indigenous Nations across present-day Canada preclude the generalization of such concepts, our conversations suggest they may be framed as a relational ethic in which individual wellness is innately interdependent on and inseparable from that of the community, future generations, and the natural world and comprised of multiple dimensions reflecting the various aspects of oneself, the quality of their relationships, and how they exist in and interact with the world around them. It is also not clear if such concepts are quantifiable, comparable, or if they can or should be measured. Promising avenues for further inquiry might include relational and reciprocal wealth models, the medicine wheel teachings, other-regarding preferences, trauma-adjusted discount rates, sustainability scoring, and collective flourishing. In all cases, doing so should be Indigenous-led, Nation-specific, and done with intention. We must also consider how mainstream economic systems and frameworks can accommodate pluralism in society and reconsider principles that are conditional on alignment with dominant institutional doctrines and ideologies.

Appendix 1 : Supplemental Material for Chapter 3

Table A.1.1 is a crosstabulation of highest level of educational attainment and major field of study for Indigenous peoples who have earned a postsecondary credential. The table lists the weighted frequencies and the frequency as a percentage of the weighted sum of all participants who have earned a postsecondary credential. Conditional formatting is applied to each column to show the relative proportion of disciplines within each level of education.

Table A.1.1: Major field of study * Education level crosstabulation.

	Apprenticeship or trades certificate or diploma	Some PSE, or completed PSE below bachelor	Bachelor's degree	Master's degree	Earned doctorate
Humanities	240 0.06%	5,720 1.34%	7,230 1.69%	2,100 0.49%	1,070 0.25%
Social & behavioural sciences, & law	2,040 0.48%	21,560 5.05%	18,050 4.23%	3,780 0.89%	
Business, management & public admin.	11,440 2.68%	62,460 14.64%	13,530 3.17%	4,590 1.08%	440 0.10%
Physical & life sciences & technologies	400 0.09%	2,590 0.61%	5,430 1.27%	690 0.16%	
Architecture, eng., & related technologies	59,350 13.91%	26,730 6.26%	3,480 0.82%	550 0.13%	
Health & related fields	9,350 2.19%	42,270 9.90%	8,020 1.88%	2,080 0.49%	630 0.15%
Education	530 0.12%	7,430 1.74%	12,690 2.97%	3,740 0.88%	460 0.11%
Agriculture, natural resources & conservation	3,520 0.82%	5,040 1.18%	2,080 0.49%	530 0.12%	
Personal, protective & transportation services	28,050 6.57%	18,380 4.31%	780 0.18%	800 0.19%	
Other	1,090 0.26%	2,020 0.47%	370 0.09%		
Visual & perf. arts, & comm. technologies	1,470 0.34%	7,460 1.75%	2,360 0.55%		0 0%
Mathematics, computer & information sciences	2,250 0.53%	7,400 1.73%	2,510 0.59%		0 0%
Total	**119,730**	**209,060**	**76,530**	**18,860**	**2,600**

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.1.2 is a cross tabulation of province or territory of residence and major field of study for Indigenous peoples who have earned a postsecondary credential. The table lists the weighted frequencies and the frequency as a percentage of the weighted sum of all participants who have earned a postsecondary

credential. Conditional formatting has been applied to the columns to show the relative proportion of disciplines within each province or territory.

Table A.1.2: Major field of study * Province/territory crosstabulation.

	Atlantic	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Territories	Total
Education	3,110	3,670	5,050	3,610	2,520	2,770	3,840	610	**25,180**
	0.72%	0.85%	1.17%	0.84%	0.59%	0.64%	0.89%	0.14%	**5.85%**
Visual & perf. arts, & comm. technologies	950	1,800	3,690	1,270	290	1,270	2,240	240	**11,750**
	0.22%	0.42%	0.86%	0.29%	0.07%	0.29%	0.52%	0.06%	**2.73%**
Humanities	1,560	3,420	5,030	1,440	720	1,500	1,580	360	**15,610**
	0.36%	0.79%	1.17%	0.33%	0.17%	0.35%	0.37%	0.08%	**3.63%**
Social & behavioural sciences, law	4,920	5,010	13,770	4,910	2,930	5,880	7,790	1,260	**46,470**
	1.14%	1.16%	3.20%	1.14%	0.68%	1.37%	1.81%	0.29%	**10.79%**
Business, mgmt. & public admin.	9,330	11,340	23,920	10,240	8,260	13,550	13,130	2,770	**92,540**
	2.17%	2.63%	5.56%	2.38%	1.92%	3.15%	3.05%	0.64%	**21.49%**
Physical & life sciences & technologies	840	960	3,090	1,250	520	750	1,560	250	**9,220**
	0.20%	0.22%	0.72%	0.29%	0.12%	0.17%	0.36%	0.06%	**2.14%**
Mathematics, computer & info. sciences	1,210	1,550	4,290	920	740	1,510	2,320	130	**12,670**
	0.28%	0.36%	1.00%	0.21%	0.17%	0.35%	0.54%	0.03%	**2.94%**
Architecture, eng., & related tech.	8,750	13,530	20,520	9,660	6,860	15,260	14,380	1,760	**90,720**
	2.03%	3.14%	4.77%	2.24%	1.59%	3.54%	3.34%	0.41%	**21.07%**
Agriculture, natural resources & conservation	990	1,250	3,250	1,260	960	1,550	1,760	450	**11,470**
	0.23%	0.29%	0.75%	0.29%	0.22%	0.36%	0.41%	0.10%	**2.66%**
Health & related fields	5,160	5,380	19,290	7,030	5,170	9,030	11,790	840	**63,690**
	1.20%	1.25%	4.48%	1.63%	1.20%	2.10%	2.74%	0.20%	**14.79%**
Personal, protective & transportation services	5,350	6,280	10,820	4,670	3,670	6,680	8,770	1,500	**47,740**
	1.24%	1.46%	2.51%	1.08%	0.85%	1.55%	2.04%	0.35%	**11.09%**
Other	140	1,750		400		810		440	**3,540**
	0.03%	0.41%		0.09%		0.19%		0.10%	**0.82%**
Total (w/o Other)	**42,170**	**54,190**	**112,720**	**46,260**	**32,640**	**59,750**	**69,160**	**10,170**	**430,600**
	9.79%	**12.58%**	**26.18%**	**10.74%**	**7.58%**	**13.88%**	**16.06%**	**2.36%**	**100%**

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.1.3 is a crosstabulation of province or territory of residence and level of education for the entire sample. The table lists the weighted frequencies and the frequency as a percentage of the sum of each column. Conditional formatting has been applied to the columns to show the relative proportion of levels of educational attainment within each province or geographic region.

Table A.1.3: Highest level of education * Province/territory residence crosstabulation.

	Atlantic	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Territories	Total
No schooling	with 420**	580	420		280	1,070		430	**2,780**
	0.10%	0.54%	0.10%		0.38%	0.37%		1.49%	**0.30%**
Grade 6 or lower, or equivalent	1,940	3,970	2,420	1,150	920	1,330	1,080	1,020	**13,830**
	2.33%	3.68%	1.05%	1.12%	1.24%	0.95%	0.72%	3.54%	**1.51%**
Grades 7 to 8, or equivalent	3,980	8,290	5,720	3,450	1,730	3,580	3,800	1,720	**32,270**
	4.77%	7.68%	2.49%	3.36%	2.34%	2.57%	2.54%	5.96%	**3.52%**
Grades 9 to 10, or equivalent	5,480	10,070	15,610	8,190	5,020	10,270	11,360	4,640	**70,640**
	6.57%	9.33%	6.78%	7.98%	6.78%	7.37%	7.60%	16.08%	**7.71%**
More than Grade 10 or equivalent	2,710	2,830	11,630	6,060	4,450	10,230	7,950	2,780	**48,640**
	3.25%	2.62%	5.05%	5.91%	6.01%	7.34%	5.32%	9.64%	**5.31%**
Secondary school diploma or equivalent	13,640	11,290	34,770	18,690	13,920	26,590	27,990	3,760	**150,650**
	16.35%	10.46%	15.11%	18.22%	18.81%	19.08%	18.72%	13.03%	**16.45%**
Some PSE	12,020	16,890	45,260	19,420	14,690	27,350	28,530	4,200	**168,360**
	14.41%	15.65%	19.66%	18.93%	19.85%	19.62%	19.08%	14.56%	**18.38%**
Apprenticeship or trades certificate or diploma	13,450	20,990	20,620	10,910	11,130	18,680	21,420	3,250	**120,450**
	16.12%	19.45%	8.96%	10.64%	15.04%	13.40%	14.33%	11.27%	**13.15%**
Non-university program length not stated	480								**480**
	0.05%								**0.05%**
Non-university program > 2 yrs	2,190	8,490	16,030	3,130	1,980	5,270	6,190	1,010	**44,290**
	2.62%	7.87%	6.96%	3.05%	2.68%	3.78%	4.14%	3.50%	**4.84%**
Non-university program of 1-2 yrs	11,230	6,330	31,660	8,660	6,110	12,130	11,610	2,540	**90,270**
	13.46%	5.87%	13.76%	8.44%	8.26%	8.70%	7.77%	8.80%	**9.86%**
Non-university program > 3 mths & < 1 yr	2,730	1,480	12,500	7,720	3,500	7,060	8,460	1,620	**45,070**
	3.27%	1.37%	5.43%	7.53%	4.73%	5.07%	5.66%	5.62%	**4.92%**
University below bach. level	1,190	3,170	3,960	3,110	2,100	2,960	6,260	460	**23,210**
	1.43%	2.94%	1.72%	3.03%	2.84%	2.12%	4.19%	1.59%	**2.53%**
Bachelor's degree	8,220	9,890	20,270	8,960	6,130	11,150	10,790	1,130	**76,540**
	9.85%	9.17%	8.81%	8.73%	8.28%	8.00%	7.22%	3.92%	**8.36%**
University above bach. level	680	920	1,340	1,190	510	300	660	70	**5,670**
	0.82%	0.85%	0.58%	1.16%	0.69%	0.22%	0.44%	0.24%	**0.62%**
medicine/ dentistry/ veterinary/ optometry	1,140								**1,140**
	0.12%								**0.12%**
Master's degree	1,850	2,720	6,880	1,940	1,000	1,400	2,900	220	**18,910**
	2.22%	2.52%	2.99%	1.89%	1.35%	1.00%	1.94%	0.76%	**2.06%**
Earned doctorate	500		1,070	with 500*	540		490		**2,600**
	0.17%		0.46%	0.17%	0.25%		0.27%		**0.28%**
Total	**83,430**	**107,910**	**230,160**	**102,580**	**74,010**	**139,370**	**149,490**	**28,850**	**915,800**

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.1.4 is a crosstabulation of the employment incomes of Indigenous peoples with different levels of education. The median income brackets for each of the education levels are highlighted in green.

Table A.1.4: Highest level of education * Total employment income crosstabulation.

	< $5000	$5000 to $9,999	$10,000 to $14,999	$15,000 to $19,999	$20,000 to $24,999	$25,000 to $29,999	$30,000 to $39,999	$40,000 to $49,999	$50,000 to $59,999	$60,000 to $69,999	$70,000 to $79,999	$80,000 to $89,999	$90,000 to $99,999	$100k and over	Total	Median Income
No schooling	280								0	0	0	0	0	0	280	$5000 to $9,999
Grade 6 or lower, or equivalent	440	310	130	**410**	480		300	280		180					2530	$15,000 to $19,999
Grades 7 to 8, or equivalent	1630	1230	560	950	**800**	600	1180	660	320	570	490			520	9510	$20,000 to $24,999
Grades 9 to 10, or equivalent	4480	2360	3510	1940	**3170**	1910	4060	1580	1470	2130	710	790	400	1150	29660	$20,000 to $24,999
More than Grade 10 or equivalent	3260	2570	1920	2540	**3220**	1840	2920	2240	1750	850	830	410	590	640	25580	$20,000 to $24,999
Secondary school diploma or equivalent	11440	8700	7080	7680	7350	**7640**	12460	9170	8820	5120	3830	2950	2130	4280	98650	$25,000 to $29,999
Some postsecondary	12440	13200	12460	9650	8610	**6490**	12230	11020	7520	5070	4530	3190	1310	6070	113790	$25,000 to $29,999
Non-university program > 3mths < 1yr	1620	2490	1440	1770	2790	**4340**	3120	2030	1120	1210	770	610	2050	2050	27410	$25,000 to $29,999
Non-university program of 1-2 yrs	4520	4210	3180	3490	3570	9540	**9310**	9000	3860	4810	2820	1820	3230	3230	66590	$30,000 to $39,999
Apprenticeship or trades certificate or diploma	3510	3390	4620	3510	4510	4690	10470	**10410**	7350	6250	4540	3870	2470	10390	79980	$40,000 to $49,999
Non-university program > 2 yrs or not stated	1610	1560	2110	1090	1410	2250	3400	**4190**	3720	3250	2290	3130	1570	2490	34070	$40,000 to $49,999
University credential below bachelor's level	720	1060	850	680	510	2200	1110	1830	**1180**	1460	1570	290	2400	2400	18260	$50,000 to $59,999
Bachelor's degree	2800	1980	2170	2750	2550	5750	5670	5400	**6010**	7230	4170	3470	9460	9460	68870	$50,000 to $59,999
Master's degree	910		1270		830		400	920	1190	1850	**820**	2090	1190	3880	15350	$70,000 to $79,999
University above bachelor's level	480			0	640			480		870		**610**	940	950	4970	$80,000 to $89,999
Medicine/ dentistry/ veterinary/ optometry	0	1190				0	grouped with 1190		grouped with 1190			**670**		1120	2980	$80,000 to $99,999
Earned doctorate																

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.1.5: Model 1.4 – Results expressed as relative risk ratios.

Employment income (<$30000 = 0)	Observed rrr	Bstrap* std. err.	t	P>t	[95% conf. interval]	
Constant	0.0434	0.0195	-6.9900	0.000	0.0180	0.1047
Grade 8 or lower	(base outcome)					
Some secondary education	1.2550 F	0.3281	0.87	0.385	0.7514	2.0962
Secondary school diploma or equivalent	2.6125 E	0.6235	4.02	0.000	1.6356	4.1730
Some postsecondary education	2.3081 E	0.5756	3.35	0.001	1.4148	3.7653
Postsecondary below bachelor's	3.3661 E	0.7692	5.31	0.000	2.1496	5.2708
Bach. degree above	5.1092	1.3321	6.26	0.000	3.0631	8.5222
Between the ages of 15 and 18	(base outcome)					
Between the ages 19 and 24	4.5121 E	1.6897	4.02	0.000	2.1639	9.4085
Between the ages 25 and 34	10.8954	4.0772	6.38	0.000	5.2279	22.7070
Between the ages 35 and 44	20.4330	7.9785	7.73	0.000	9.4964	43.9648
Between the ages 45 and 54	17.4202	6.6552	7.48	0.000	8.2313	36.8671
Age 55 and over	10.8930	4.1990	6.20	0.000	5.1125	23.2093
Began working in 2016 or 2017	(base outcome)					
Began working between 2011 and 2015	2.4696	0.2388	9.35	0.000	2.0427	2.9856
Began working before 2011	5.0520	0.5675	14.42	0.000	4.0526	6.2979
Full-time employment	(base outcome)					
Part-time employment	0.1163	0.0129	-19.38	0.000	0.0936	0.1446
Trades, transport equip. op. and related...	(base outcome)					
Manufacturing and utilities	0.9709 F	0.1968	-0.15	0.884	0.6523	1.4452
Natural resources, agriculture and related	1.5529 F	0.3982	1.72	0.086	0.9389	2.5685
Sales and service occupations	0.3992	0.0534	-6.86	0.000	0.3070	0.5191
Art, culture, recreation and sport	0.2043 E	0.0567	-5.72	0.000	0.1185	0.3524
Education, law, social, community and gov.	0.5523 E	0.0859	-3.82	0.000	0.4071	0.7494
Health occupations	0.7349 F	0.1461	-1.55	0.122	0.4975	1.0856
Natural and applied sciences and related	1.0955 F	0.2488	0.40	0.688	0.7015	1.7107
Business, finance, and administration	1.1710 F	0.1845	1.00	0.316	0.8597	1.5952
Management occupations	0.4680 E	0.1177	-3.02	0.003	0.2857	0.7667
On-the-job training is provided	(base outcome)					
Secondary and/or job-specific training	1.1579 F	0.1657	1.02	0.306	0.8743	1.5333
College or apprenticeship training	1.7867 E	0.2740	3.78	0.000	1.3224	2.4141
University education	2.9078 E	0.5764	5.38	0.000	1.9708	4.2905
Male	(base outcome)					
Female	0.5114	0.0490	-6.99	0.000	0.4237	0.6173
Single identity - First Nations	(base outcome)					
Single identity - Metis	1.0906 F	0.0938	1.01	0.313	0.9213	1.2910
Single identity - Inuk (Inuit)	1.1341 F	0.1314	1.09	0.278	0.9035	1.4236
Multiple identities	1.1100 F	0.3476	0.33	0.739	0.6003	2.0523
Responses not included elsewhere	0.5240 F	0.2670	-1.27	0.205	0.1928	1.4244

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)
*The Bstrap in "Bstrap *" indicates that the standard errors were computed using the bootstrap resampling method. By default, vce(bootstrap) and bootstrap compute the variance using deviations of the bootstrap replicates from their mean.*
*The * in "Bstrap *" indicates that the standard errors were calculated using the mean squared error (MSE) formula of the bootstrap variance estimator.*

Appendix 2 : SUPPLEMENTAL MATERIAL FOR CHAPTER 4

Table A.2.1: Percentages of funding sources across levels of PSE.

	Some postsecondary	Postsecondary below bachelor	Bachelor's degree or higher	Total
Funded by other parties	30.7%	56.5%	12.8%	100.0%
	106,870	196,464	44,662	347,995
Funded by self and other parties	19.9%	46.1%	34.0%	100.0%
	25,497	59,181	43,582	128,260
Self-funded	29.4%	56.5%	14.1%	100.0%
	34,119	65,555	16,326	115,999
Total	28.1%	54.2%	17.7%	100.0%
	166,485	321,200	104,569	592,254

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.2.2: Percentages of education levels by funding sources.

	Some postsecondary	Postsecondary below bachelor	Bachelor's degree or higher	Total
Funded by other parties	64.2%	61.2%	42.7%	58.8%
	106,870	196,464	44,662	347,995
Funded by self and other parties	15.3%	18.4%	41.7%	21.7%
	25,497	59,181	43,582	128,260
Self-funded	20.5%	20.4%	15.6%	19.6%
	34,119	65,555	16,326	115,999
Total	100.0%	100.0%	100.0%	100.0%
	166,485	321,200	104,569	592,254

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.2.3: Model 2 – Results expressed as relative risk ratios.

	Observed rrr	Bstrap* std. err.	t	P > |t|	[95% conf. interval]	
Low income (<$30,000 CAD)	(base outcome)					
High income (≥$30,000 CAD)						
Constant	0.9407	0.3531	-0.16	0.871	0.4503	1.965
Postsecondary below bachelor level	(base outcome)					
Bach. degree or above	1.6955	0.2503	3.58	0	1.2691	2.2652
Between the ages of 15 and 24	(base outcome)					
Between the ages of 25 and 34	1.6981	0.2544	3.53	0	1.2656	2.2784
Between the ages of 35 and 44	2.8782	0.4885	6.23	0	2.0628	4.0157
Between the ages of 45 and 54	3.4983	0.7129	6.14	0	2.3452	5.2183
Age 55 and over	1.9012	0.3216	3.8	0	1.3641	2.6497
Began working in 2016 or 2017	(base outcome)					
Began working between 2011 and 2015	2.3935	0.3231	6.47	0	1.8365	3.1193
Began working before 2011	4.4880	0.6847	9.84	0	3.3268	6.0545
Full-time employment	(base outcome)					
Part-time employment	0.109	0.017	-14.63	0	0.081	0.147
Trades, transport and equip. operators and rel.	(base outcome)					
Manufacturing and utilities	1.6857	0.5910	1.49	0.137	0.8472	3.3542
Natural resources, agriculture and rel. production	0.7551	0.2688	-0.79	0.43	0.3755	1.5186
Sales and service	0.4513	0.0933	-3.85	0	0.3009	0.6770
Art, culture, recreation and sport	0.2271	0.0761	-4.42	0	0.1177	0.4383
Education, law and social, community and	0.7586	0.1783	-1.18	0.24	0.4784	1.2031
Health	1.0944	0.2773	0.36	0.722	0.6657	1.7992
Natural and applied sciences and related	1.43E+00	0.4148	1.24	2.16E-01	8.10E-01	2.5275
Business, finance, and administration	1.2654	0.2777	1.07	0.284	0.8226	1.9466
Management	0.6538	0.2141	-1.3	0.195	0.3438	1.2431
D - On-the-job training is provided	(base outcome)					
C – Sec, school and/or job-specific training	1.0287	0.2622	0.11	0.911	0.6239	1.6963
B - College or apprenticeship training	1.4355	0.3632	1.43	0.153	0.8737	2.3584
A - University education	2.2578	0.6505	2.83	0.005	1.2828	3.9738
Male	(base outcome)					
Female	0.5253	0.0730	-4.63	0	0.3998	0.6900
Single identity - Status First Nations	(base outcome)					
Single identity - Métis	1.0022	0.1402	0.02	0.988	0.7616	1.3186
Single identity - Inuk (Inuit)	1.0035	0.1865	0.02	0.985	0.6969	1.4451
Multiple Aboriginal identities	1.2308	0.6217	0.41	0.681	0.4568	3.3164
Aboriginal responses not included elsewhere	5.01E+07	1.51E+08	5.89	0	136296.1	1.84E+10
Funded by other parties only	(base outcome)					
Funded by self and other parties	0.9622	0.1654	-0.22	0.823	0.6867	1.3483
Self-funded only	1.4353	0.3202	1.62	0.106	0.9264	2.2237
Reason for program choice:	(base outcome)					
Lot of jobs in this field	1.1876	0.1379	1.48	0.139	0.9457	1.4914
Personal interest	0.9521	0.1775	-0.26	0.793	0.6604	1.3728
Recommended	1.2029	0.1330	1.67	0.095	0.9683	1.4943
Good reputation	0.8883	1.43E-01	-7.30E-01	0.463	0.6470	1.2194
Program length	1.3172	0.2353	1.54	0.123	0.9277	1.8702
Wanted to help community	0.6569	0.0844	-3.27	0.001	0.5106	0.8452
Other	1.09E+00	0.1412	0.66	5.07E-01	8.45E-01	1.4054
Postsecondary guidance received	0.9500	0.0530	-0.92	0.358	0.8515	1.0599
Métis # Funded by self and others	1.2279	0.3212	0.78	0.433	0.7349	2.0515

Métis # Self-funded only	0.9423	0.3029	-0.18	0.853	0.5015	1.7706
Inuk (Inuit) # Funded by self/others	1.4299	1.6789	0.3	0.761	0.1428	14.3192
Inuk (Inuit) # Self-funded only	3.3670	1.9389	2.11	0.035	1.0876	10.4235
Multiple identities # Funded by self/other	3.6374	4.1612	1.13	0.259	0.3853	34.3358
Multiple identities # Self-funded only	0.3879	0.4220	-0.87	0.384	0.0459	3.2791
Not incl. elsewhere # Funded by self/others	0.5292	0.2689	-1.25	0.211	0.1953	1.4343
Not incl. elsewhere # Self-funded only	2.09E-08	6.48E-08	-5.71	0.00E+00	4.79E-11	9.14E-06

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Table A.2.4: Model 3 – Results expressed as relative risk ratios.

	Observed rrr	Bstrap* std. err.	t	P > |t|	[95% conf. interval]	
Postsecondary below bachelor level	(base outcome)					
Bach. degree or above						
Constant	0.0864	0.0282	-7.5	0	0.0455	0.164
Between the ages of 15 and 24	(base outcome)					
Between the ages of 25 and 34	1.9345	0.2942	4.34	0	1.4353	2.6073
Between the ages of 35 and 44	1.9986	0.3086	4.48	0	1.4761	2.706
Between the ages of 45 and 54	1.5071	0.215	2.88	0.004	1.1391	1.994
Age 55 and over	1.5469	0.2057	3.28	0.001	1.1916	2.008
Male	(base outcome)					
Female	1.2099	0.1102	2.09	0.037	1.0119	1.4466
Residence - Urban Centre	1.8933	0.2036	5.94	0	1.5331	2.3381
Single identity - Status First Nations	(base outcome)					
Single identity - Métis	0.8315	0.1073	-1.43	0.153	0.6455	1.071
Single identity - Inuk (Inuit)	0.6797	0.1406	-1.87	0.062	0.4529	1.0202
Multiple Indigenous identities	0.3579	0.1933	-1.90	0.057	0.1240	1.0331
Responses not included elsewhere	1.4571	1.7132	0.32	0.749	0.1450	14.64
Funded by other parties only	(base outcome)					
Funded by self and others	2.8388	0.3948	7.5	0	2.1609	3.7295
Self-funded only	0.8628	0.1661	-0.77	0.444	0.5913	1.2589
Reason for program choice:						
A lot of jobs	0.5619	0.0505	-6.42	0	0.4711	0.6702
Personal interest	2.5373	0.4522	5.22	0	1.7885	3.5995
Recommended	1.1362	0.0992	1.46	0.144	0.9573	1.3486
Good reputation	1.3519	0.1697	2.40	0.017	1.0567	1.7295
Program length	0.4189	0.0517	-7.05	0	0.3289	0.5337
Help community	2.4301	0.2292	9.41	0	2.0195	2.9241
Other	1.0234	0.1112	0.21	0.831	0.8269	1.2667
Postsecondary guidance received	0.9481	0.0408	-1.24	0.216	0.8714	1.0316
Neither respondent nor family attended	(base outcome)					
Immediate or other family attended	0.626	0.0662	-4.43	0	0.5087	0.7704
Parents or grandparents attended	0.4649	0.0683	-5.21	0	0.3484	0.6204
Respondent attended	0.395	0.0808	-4.54	0	0.2644	0.5902
Sense of belonging - Indigenous community	1.1296	0.0687	2.01	0.045	1.0026	1.2727
Sense of belonging - Canada	0.8654	0.0439	-2.85	0.004	0.7833	0.956
Métis # Funded by self/others	1.0695	0.2044	0.35	0.725	0.7349	1.5562
Métis # Self-funded only	1.2212	0.3153	0.77	0.439	0.7358	2.0267
Inuk (Inuit) # Funded by self/others	3.2588	1.1756	3.27	0.001	1.6055	6.6145
Inuk (Inuit) # Self-funded only	0.7792	0.526	-0.37	0.712	0.2072	2.9307
Multiple identities # Funded by self/others	3.8553	3.1972	1.63	0.104	0.7573	19.6253
Multiple identities # Self-funded only	0.4331	0.4118	-0.88	0.379	0.067	2.7982
Not incl. elsewhere # Funded by self/others	0.9141	1.8215	-0.05	0.964	0.0183	45.6311
Not incl. elsewhere # Self-funded only	3.3969	5.0319	0.83	0.409	0.1856	62.1622

Source: Constructed by author using data from Aboriginal Peoples Survey, 2017 (APS, 2017)

Appendix 3 : Supplemental Material for Chapter 5

Sharing Circle Questions

1. Think back to when you were on the fence about this decision - pursuing your postsecondary program.
    a. What were some of the factors that influenced this decision - social, economic, cultural, …?
    b. What did you consider to be the benefits, costs, concerns?
    c. Was there a specific moment in time when you made this a goal? - Tell us about that moment.
    d. Essentially, tell us the story from your perspective of how you came to be on this path.
2. Describe your education journey since then.
    a. Share two things that were helpful or important, and two things that you would change, or think could be done differently?
3. Describe your education experience in terms of your student and staff interactions, the learning environment, and your educational experience.
    a. What are the most important strategies you have for maintaining your cultural connection and identity while working within these institutions? (For example, staying connected with your community, incorporating 2 eyed seeing or Indigenous research methods, decolonizing the process, etc.)
4. What makes you feel competent at what you do? How do you experience validation?
5. To what extent do your goals intersect with the goals of your community or other Indigenous communities?
6. What is the relationship between research and innovation and where do they intersect/overlap?
7. Do you think that communities are receptive to engaging with your research/ educational/innovation pathways?
8. What do you believe could be put in place to encourage more graduate students to pursue graduate research and innovation with Indigenous businesses and communities?
9. What are the key characteristics of innovative people in your community and/or what are the key characteristics that contribute to innovation in your community?
10. What does Indigenous innovation mean to you?

Individual Interview Questions

1. At what point did you know you wanted to become a researcher or pursue this educational pathway?
    a. Was there a specific point or moment in time?
2. Can you tell us about your motivations to pursue this career trajectory, what were some of the things that were demotivating you (self-efficacy, self-confidence)?
3. What makes you feel that you are competent at what you do?
    a. How do you experience validation as a researcher?
4. Have you had mentors or role models along your journey to pursue higher education/research pathways?
    a. How important was that positive influence to your current success?
    b. Did the relationships form organically or was it the result of a structured initiative?
5. Have you found allies to help you with your education and/or research?
    a. How did you establish those relationships?
    b. How have they helped you?
6. What were some of the external barriers that you faced at that time?
7. How do you [Can you] identify problems in Indigenous communities that need solutions related to your research?
8. How might your research lead to innovations with positive utility in Indigenous communities?
9. How does Indigenous Innovation foster well-being in Indigenous communities?
10. How have you been innovative along your educational and professional path?

Appendix 4 : Indigenous Ways of Knowing, Being and Doing in Mainstream Capitalist Societies

A.4.1 Introduction

For more than 5000 years, most of the world has been continuously connected through trade, migration, warfare, and cultural exchange (Frank, 1990). Many of these societies throughout present-day Europe, Asia and Africa evolved in parallel through social networks and complex systems of governance and exchange. According to Muthukrishna & Henrich (2016), these networks and continuous interconnection served as a collective brain, not only facilitating the mobilization of knowledge and diffusion of ideas and beliefs, but also accelerating the pace of social and technological innovation. These benefits, however, came at a cost in the form of reduced diversity amongst member societies through acculturation and the homogenization of cultures and lifestyles (Schimmelpfennig et al., 2021). Today, there remain relatively few surviving cultures that developed independently of this collective brain. Among them are Indigenous peoples throughout present-day Oceania, South America, Mesoamerica, and North America. This is especially true for the Inuit, Dene and other subarctic societies which were largely insulated from the rest of the world by the natural landscape.

A.4.1.1 Diversity of Thought and Experience

Historically, differences born from culture and ethnicity have sown division in societies and served to justify the alienation, dehumanization and subjugation of entire populations. These differences, however, also provide a multitude of perspectives which have proven instrumental in human evolution and fitness (Smit, 2018). One factor central to the diversity of perspectives lies in the languages used to describe the world. Language is not just a means to communicate, it dictates inner speech, frames thought, and shades and colours the conscious experience. It is innately connected to human neurophysiology serving as an underlying architecture regulating the interpretation of experience and shaping our understanding of the world. The time it takes for them to form is unknowable though they are believed to have existed for 60,000 generations (Everett, 2017). They provide us with a different way to view and understand the world that had been in the making since the dawn of humanity. Apart from humanity itself, these differences could arguably be humanity's greatest resource and appreciating the intrinsic value of individual differences and diverse perspectives are a necessary condition to achieving inclusivity within increasingly diverse global societies. By respecting each other's stories and ways of knowing we can bridge gaps in our understanding and create a space for everyone to exist that maintains the integrity of our identities and voices—a space

where every voice is heard and every perspective is seen as a vital contribution to the collective learning experience.

When individuals from varied backgrounds and cultures come together, they bring a variety of perspectives that can challenge conventional thinking and craft novel and innovative solutions (Munford & Sanders, 2011). Recent research indicates that ethnic diversity in early-stage ventures stimulates innovation and creativity, enhances adaptability and improves decision-making and problem-solving. Diverse teams are more representative of global consumer bases, better able to identify and anticipate a broader range of challenges and opportunities and, as a result, more attractive to investors (Audretsch et al., 2010; Muzychenko, 2008; Nathan & Lee, 2013; Wise et al., 2022). Just as ecosystems thrive on biodiversity, the global economic landscape is enriched and made more resilient by embracing diversity.

A.4.1.2 Two-Eyed Seeing and Trans-Systemic Knowledge Systems

Two-Eyed Seeing is an idea introduced by a Mi'kmaq Elder, Albert Marshall, to build greater capacity for stem programming for Indigenous postsecondary students (Bartlett et al., 2007). It refers to learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing (Bartlett et al., 2012). It challenges us to see through both lenses simultaneously and teaches us the value of diversity and that all perspectives can coexist. Since its inception, two-eyed seeing has been applied to a variety of sectors from academia to medicine and resource management (Greenwood et al., 2015; Hatcher et al., 2009). It is not a linear process with targeted outcomes nor a tool for profit generation. Rather, it is a guiding framework for coexistence and complementarity in knowledge that necessitates relationship building and a commitment to ongoing conversation. It presents a roadmap to establishing mutually beneficial relationships and achieving true trans-cultural collaborations because embedded within it are principles of reciprocity, mutual accountability and co-learning.

Building on the coexistence and complementarity in knowledge is the idea of trans-systemic knowledge systems which transcend traditional dichotomies to acknowledge the multitude of knowledges and ways of knowing across the globe. This approach treats all knowledge systems as equal, complimentary and incomplete.(M. Battiste & Henderson, 2021). A notable strength of this approach is in solving systemic issues or wicked problems which are innately complex, require multi-faceted solutions and where no single discipline or knowledge system can provide enough context to gain a fulsome understanding of these issues. Practitioners of trans-systemic knowledge appreciate that individual knowledge systems are just one piece of a much larger puzzle and that the only way to solve certain complex problems is through collaboration (Kassam, 2021). It is an approach which fosters understanding through diverse perspectives and provides

a path to acknowledging and appreciating the contribution of all knowledge systems to the collective learning experience (Kelly & Woods, 2021).

A.4.2 Indigenous Worldviews and Ways of Knowing, Being and Doing

"Knowledge is a living garden with a living spirit"

– Elder Albert Marshall (n.d.)

Indigenous knowledge is culturally specific knowledge unique to Indigenous peoples that has been passed down and time tested. It is innately connected to the identity of Indigenous peoples and recognized under international law as deserving of protection (Coombe, 2001). It is knowledge at an experiential level that has been cultivated over thousands of years of coexistence with the natural world (First Rider, 1994; Seepe, 2001). It is often talked about as being alive or in constant flux and holistic—it looks at the relationships between all beings as they exist and interact with each other and their environment (First Rider, 1994; Little Bear, 2012). A notable strength of systems thinking or holistic perspectives is that they provide a more comprehensive understanding of complex systems, such as ecosystems or social structures (Kawagley & Barnhardt, 1998; Little Bear, 2012). According to Leroy Little Bear (2004), "If everything is forever moving and changing, one has to look at the whole of being to discern developing patterns. It is a way of thinking that looks at the forest and not the trees. The holistic view, in turn, gives rise to values that regard the group as more important than the individual. It values a 'generalist' more than the 'specialist'" (Little Bear & Wilkins, 2004). Below are examples of Indigenous knowledges, worldviews, and ways of being and their expressions in mainstream capitalist societies.

Knowledge dissemination and orientation. The shift to written texts in mainstream society has many benefits, but it also removes the relational component of knowledge dissemination which is a defining feature of oral histories and traditions of storytelling (Wiesner, 2021). Historically, Indigenous knowledge was passed down orally through stories, teachings and traditions. While often labelled as primitive (Lowie, 1917), it is more conducive to strengthening relationships and shifts focus on the application of knowledge rather than its accumulation. Traditionally, knowledge wasn't pursued as a mental exercise but rather cultivated towards achieving a specific outcome. It was action-oriented and has been the basis for agriculture, food preparation, healthcare, education, conservation, and a range of other activities that sustain societies.

Knowledge is relational. Knowledge is often treated as participatory, relational and experiential. It is something that people come to understand through the relationships they develop with all things as they exist within and interact with the world around them. It is learned through direct experience and observation

of the natural world and most often considered a collective resource to be shared. In contrast, knowledge in Western cultures tends to be individualistic, proprietary, specialized and acquired through formal education. It is often treated as something that is created and owned by an individual or entity who is afforded legal protection over its use.

Self-awareness, Self-realization, and Self-actualization. Indigenous societies and teachings often place significant value personal growth and developing and understanding of themselves—their character, motives, desires, values, beliefs, and perspectives. This is not a linear process with clearly defined goals or targeted outcomes, rather it is process-oriented where the path taken can be more important than where it ends. According to Ross (2009), "The red road never ends" (Ross, 2009). This means that personal growth, learning and spiritual development are lifelong processes and encourages the continual pursuit of balance, understanding and harmony. This awareness is essential to manifesting one's unique potential and meaningfully contributing to the world.

All Life is Sacred and Equal. This is a worldview derived from the concept of spirituality and the interrelatedness of all things. Indigenous peoples have come to understand that all life is related regardless of whether that life is human or non-human. In contrast, there is often a sharp divide between humans and nature in Western cultures which tend to believe that humans are superior to other life forms (Mutua, 2002). This difference in perspective is important because if people appreciate other beings as their relations, then they become more than mere commodities. This also extends beyond the natural world to how we treat one another. According to Elder Joanne Dallaire, "We sit in circles because there is no in front, behind, above, or below—because we're all of equal value in the circle of life."

> *"In my opinion, the pyramid structures seen in many of the dominant cultures are the frameworks to enslave people; to create a divide amongst the people and they bring out the worst in people. […] The correct structure is a flat circular structure. Understanding that each person is a part of that circle and contributes to the whole. That they are equal and there is no superiority. And when you live in a structure like this, you get the best of people. You get people's full potential."*
> (J. Araujo Redbird, personal communication, February 11, 2022)

Respect & Reciprocity. The idea of respect and reciprocity applies equally to human relationships and to the natural world. This is fundamental to the Anishinaabe way of life and a central tenet of the Indigenous relational approach described in Sect. 2.2. It considers humans as part of a broader community of beings, recognizing the importance of protecting the natural world. This relationship with nature often extends beyond a moral duty or sense of responsibility. Many Indigenous peoples take care of the land out of love, not because they are forced or expected to. Respect and reciprocity often go hand-in-hand, especially as

they pertain to the natural world. Many are taught to never take without giving, regardless of the reason. This could involve making offerings, conducting ceremonies, practicing sustainability, or otherwise contributing to the wellbeing of the ecosystem.

Cyclical Philosophy. In a cyclical philosophy, life is seen as a series of interconnected cycles or circles, rather than a straight line with a clear beginning, middle, and end (M. A. Battiste & Little Bear, 2000). This can apply to various aspects of life and the natural world, including the changing seasons, the cycle of day and night, life and death, and human development. It can influence perceptions of and attitudes towards elements of life such as relationships, sense of time, approach to problem-solving, and how concepts such as growth, progress, and change are defined. It can also help foster an appreciation for continuity, balance, and the rhythms of life. In business, it might mean leaning into natural business cycles rather than forcing a linear progression. This can promote resilience, adaptability, and sustainability and can have significant implications on how a business is managed and how success is defined.

Spirituality and Interconnectedness. This is a worldview that is holistic and sees all things as interconnected and interdependent. This includes relationships between humans and the environment, individuals and societies, and the physical and spiritual realms. Spirituality is a subject that is rarely mentioned in professional settings within mainstream society but is often considered inseparable from Indigenous worldviews and ways of being.

> *"All of us as Indigenous people know this, that our spirituality is completely who we are. It's not a separate thing. So, it's no surprise that it informs everything that I do."*
> (A. DeMontigny, personal communication, February 15, 2022)

To understand the role of spirituality, it is necessary to expand spirituality beyond the euro-based definition which limits it to the human spirit or soul. Spirituality in Indigenous teachings is much broader. It encompasses the interconnectedness of all things and is grounded in relationships with the natural world. It is an acknowledgement that individuals do not exist as distinct entities in the world and transcends self-interests in honouring our collective role in all of creation.

Female Leadership. Indigenous Nations and communities across present-day Canada have a long history of female leadership and matrilineal descent. In many, including the Míkmaq and Haudenosaunee Nations, women held most of the power and were responsible for ensuring the wellbeing of their Nations. Clan mothers were responsible for making important decisions, overseeing harvests and resources, and in some cases would appoint a male Chief. Though largely disrupted by colonialism and the imposition of patriarchal systems, the tradition of strong female leadership has persevered and is evidenced in the

relatively greater percentage of women-owned Indigenous businesses. The percentage of women-owned businesses in Canada grew from 15.6% in 2017 to 18% in 2023 whereas women-owned Indigenous businesses has averaged 23.2% from 2005-2018 and over a quarter of all Indigenous SMEs are majority-owned by women (Cukier et al., 2022; Gueye et al., 2022; Jakobsh, K. & Boskov, S., 2020).

> *"You tend to see very strong female leadership in many Indigenous businesses. So, a strong sense of female ownership. It has not always been easy. In some cases, women have had to come overcome the same male-dominated systems that mainstream women have had to overcome and are still overcoming to this day."*
> (K. Lendsay, personal communication, January 25, 2022)

A.4.2.1 The Relational Approach and Mutualism

The relational approach is a philosophy grounded in interconnectedness, reciprocity, mutual respect, and responsibility towards the community and the environment. It is rooted in the traditional worldviews of Indigenous peoples and reflected in various aspects of Indigenous cultures including social structures, systems of governance, knowledge systems, and spirituality (Atleo, 2011; Bohaker, 2021; McCoy, M. et al., 2020). It emphasizes relationships amongst humans and with the natural world which includes animals, plants and spiritual beings, as well as elements like the land, water, and sky (Tynan, 2021). It is an acknowledgement of the interconnectedness and interdependence that exists among all elements of creation and provides a lens to understand the broader ecologies governing life. It blurs the lines between oneself and others, humans and non-humans, animate and inanimate, physical and non-physical, and acknowledges that people are both individually and collectively inseparable from the whole of creation (Little Bear, 2012; Peña, 2017; Vannini & Vannini, 2019). This inseparability also implies that the wellbeing of each entity is intimately and inseparably connected to and dependent on that of all other entities. According to Cliff White, "So, for us to realize that wildlife is actually, again, kind of a mirror of ourselves and how a whole assemblage of other species has reacted to us, and where they live, how they live, what they do, reflects a long-term, 100,000-year relationship with us, and that relationship is very important" (Vannini & Vannini, 2019).

A.4.2.2 Indigenous Collectivism and Community Orientation

Indigenous collectivism and Western individualism are a reflection of fundamentally different value systems that influence many aspects of society. Western societies, particularly those influenced by European enlightenment ideals, tend to place significant value on individualism, which prioritizes the rights, needs and goals of the individual (Colbourne et al., 2017). Key aspects of Western individualism

include independence and personal freedoms, self-reliance, competition, property ownership, wealth accumulation, and majority rule. In contrast, Indigenous societies more often exhibit a collectivist mindset which prioritizes the rights, needs and goals of the community (Frederick & Henry, 2003; Henry et al., 2007). They tend to adopt a holistic approach, which strives for balance and harmony across several dimensions of wellbeing and for a broader range of stakeholders including the natural world and future generations.

Community-centred or collective approaches to business often manifest as hybrid ventures. In fact. one of the hallmarks of Indigenous-led businesses is a strong community orientation shifts the focus from solely maximizing profit to also improving the wellbeing of the broader community. These businesses are often treated as a pathway for community empowerment and cultural preservation (Colbourne et al., 2017). Wanda Wuttunee describes this alignment of economic activities with the priorities, values and wellbeing of the community as "Community Capitalism." These systems regard the good of the community and that of the individual as innately interdependent and strive for the simultaneous pursuit of both (Wanda & Wien, 2024).

> *"Initially over 75% of [Indigenous] businesses indicated that they were negatively impacted by covid but close to 40% indicated that they had pivoted their product in some way or their business in some way to be able to give back to the community. So even when these businesses are struggling day to day, they're still looking at how they can support communities through a difficult time."*
> (T. Bull, personal communication, February 11, 2022)

A community-oriented approach can benefit companies by enhancing their reputation, improving customer loyalty, attracting and retaining employees, partnering with local organizations and governments, and enhancing resiliency (Purcell & Scheyvens, 2015). It encourages greater knowledge and skill sharing, which can foster innovation and collective learning leading to more resilient economic systems and a more equitable distribution of wealth.

The community-oriented approach exemplified in the over 500 community-owned Indigenous Economic Development Corporations (EDCs) across Canada (CCAB, 2020). These corporations are for-profit entities developed by and for communities to pursue commercial opportunities (Missens et al., 2010). They help to address socio-economic challenges and promote economic empowerment through job creation, capacity building, skills development and revenue generation (OECD, 2020). EDCs are also conducive to local entrepreneurship as they often sell established ventures in their portfolio to members of the community.

"As these corporations mature, they start to get into more sophisticated types of business enterprises and structures and so they start to sell off or spin off smaller ventures to entrepreneurs who would then run them."
(K. Lendsay, personal communication, January 25, 2022)

EDCs are a way for communities to generate Own-Source Revenue (OSR) which has several important implications. They promote self-sufficiency by reducing dependency on foreign governments, reduce exposure to economic fluctuations through the diversification of revenue streams, increase standards of living, and ultimately empower communities to shape their economic futures in their own way and on their own terms.

"[Community-owned businesses] take all that money and throw it into a dividend that goes back to the community. If they're an Economic Development Corporation, it goes into education, housing, health, social services, children… It's a total replenishment of those funds back into community development."
(K. Lendsay, personal communication, January 25, 2022)

A.4.2.3 The Seventh Generation Principle and Long-term Orientation

The Seventh Generation Principle dates back over 500 years to the writing of The Great Law of Haudenosaunee (Iroquois) Confederacy. It is based on an ancient philosophy that the decisions made today should result in a sustainable world seven generations into the future (Joseph, 2018). It encourages an understanding of the interconnections between all living things and the responsibility each generation carries for those who come after. This principle goes beyond environmental sustainability and applies equally to cultural, social and economic sustainability (Da Costa et al., 2021). It has far-reaching implications in how practitioners live their lives and is the basis of the long-term orientation adopted by many Indigenous businesses. Under this principle, businesses are encouraged to consider the kind of world they are helping to create and leaving behind. The Seventh Generation Principle embodies an understanding of time and responsibility that contrasts with the short-term focus prevalent in mainstream society. When applied within the context of a mainstream capitalist economy, it suggests a shift away from short-term profits and towards long-term sustainability and multi-generational value creation (Lyons, 1992). More recently, the Seventh Generation Principle has become a rallying point in environmental movements and is being increasingly adopted by Indigenous and non-Indigenous organizations alike. This long-term orientation is also not specific to the Haudenosaunee Nations or the Great Lakes Region but rather considered a defining feature of the Indigenous economy in Canada (Hilton, 2021). In fact, wealth in the Coast Salish economy is considered a function of cultural and community continuity and symbolized by the Nation's children and grandchildren.

A.4.2.4 The Seven Grandfather Teachings and Values-based Governance

The Seven Grandfather Teachings are the foundation for an Indigenous way of life to many Indigenous peoples in North America, particularly around the Great Lakes region (Benton-Banai, 2010). They are an Anishinaabe doctrine or traditional Indigenous value system that act as a way of being with each other, with ourselves, and with the land. The Anishinaabe, or "original people," describes one of the largest culturally related groups of Indigenous peoples in North America. It is used as a collective term for several Nations including the Ojibwa, Odawa, Potawatomi, Algonquin, Nipissing, Oji-Cree, Mississaugas, and Saulteaux (Karl S. Hele, 2022).

The teachings have ancient origins and cannot be attributed to any individual. It is a sacred truth passed down through the ages since time immemorial. Together, they provide the tools to live a good life in peace and harmony with all of creation and a path to mino-bimaadiziwin—living in a good way. They can be thought of as an ethical framework, similar in nature to the tradition of virtue ethics (Kotalik & Martin, 2016). These teachings are the product of learned wisdom cultivated over many thousands of years and provide a glimpse into a different way of life and being.

Most mainstream societies today elect governments who attempt to codify all manners of unacceptable behaviour in an ever-expanding list of regulations, policies and laws. While there are examples of laws in Anishinaabe societies, many instead relied primarily on values-based systems of governance. Rather than telling people what they are not allowed to do, they taught them the values they should strive to embody. It is in learning to live these teachings that people naturally do good things, not because doing so wouldn't break any rules, but because of an intuitive sense of right or wrong honed through traditional values and social expectations.

A.4.2.4.1 Defining the Teachings

Each of the Seven Grandfather Teachings are listed below alongside the Anishinaabe words for each teaching. Each of the teachings are also accompanied by a brief definition drawn from the author's teachings and lived experience. It is important to acknowledge that not all Indigenous cultures recognize these teachings. There are several variations of these teachings, and each teaching may be interpreted differently in different communities or even by different individuals within the same community. It is also important to acknowledge that many of the nuances of these teachings are lost in the definitions. The only way to know the true meaning of these teachings is to live them.

Debwewin (Truth). Truth is the recognition and acceptance of reality as it is, including the laws of nature and the interconnectedness of all things. It is to have integrity in all things and live our lives with authenticity and in accordance with our values and beliefs (Mihalicz, 2024). it is about understanding and acknowledging the role that individuals play in the grand scheme of life and living in harmony with themselves, others, and the environment. To live in truth is to live authentically and act in ways that are consistent with our understanding of reality and our values. Truth is represented by the turtle who carries all of life's teachings on its back (N.A., N.D.). The turtle moves in a slow and careful manner in recognition of the time and patience required to understand the deeper truths of life and existence. The turtle understands the value of both the journey and the destination. It teaches us to be true to and honest with everyone, especially ourselves, and to live all seven teachings.

Minaadendamowin (Respect). Respect is mutual and reciprocal in nature—you must give it in order to receive it. It is to hold in high regard and attaches to all creation including nature, creatures, people, the earth, and oneself. True respect is only possible by getting to know someone or something. It is born from a deeper understanding that develops over time as a result of the relationships we cultivate (Mihalicz, 2024). Respect is represented by the buffalo who gives every part of itself so that the people may survive. It teaches us that true respect must be shown to all things, not just those we depend on or those that are of benefit to us (N.A., N.D.).

Zaagi'idiwin (Love). According to Benton-Banai (1988), "To know Love is to know peace." Love is the unconditional act of caring, giving, and being in harmony with all of life, including future generations. Love is one of the hardest teachings to practice and, like respect, love is mutual and reciprocal. It must be given freely and unconditionally, but to love others, we must first learn to love ourselves (Mihalicz, 2024). Love is represented by the eagle because it has the strength to carry all the teachings (N.A., N.D.). The eagle is often associated with vision, strength, and courage. It can fly high in the sky and is able to see all ways of life with spiritual clarity (Benton-Banai, 2010).

Aakode'ewin (Bravery). Bravery is to face adversity and persevere through difficulty. It means doing the right thing and standing up against things that are not right, even in the most difficult situations and despite any unpleasant consequences (David Bouchard, 2016). Bravery is represented by the bear which is both a healer and a protector (N.A., N.D.). The bear teaches us to live a balanced life, to be brave when facing obstacles, and to have the mental and moral strength to be our true selves. Bears also teach us tolerance and introspection. They prefer peace and would rather avoid trouble but will fight fiercely if needed and never give up in the face of danger.

Nibwaakaawin (Wisdom). Wisdom is born of experience and living a good life. It is a gift that comes with age, experience, and reflection that involves understanding the interconnectedness of all things, learning from our mistakes, making good decisions, and showing discernment in our actions (Mihalicz, 2024). Wisdom is not merely about having knowledge or intellectual abilities, but rather about using one's knowledge and abilities for the betterment of ourselves, our communities, and the environment. Like all the teachings, wisdom is an ongoing process of learning, self-improvement, and contribution to the well-being of others. Wisdom is represented by the beaver which also symbolizes perseverance, cooperation, and hard work (N.A., N.D.). The beaver uses its gifts to transform its environment in a way that not only ensures its own survival but also ensures the survival of other creatures. It teaches us that we all have gifts and to use those gifts wisely for the greater good. The strength and vitality of a community hinge on the talents, skills and experiences of each of its members. It is not just a result of the collective efforts, but also a testament to the diversity of their gifts and how they use them to contribute to the wellbeing of the community.

Gwayakwaadiziwin (Honesty). To be honest is to be genuine and act without fraud or deception. It means being true to oneself and others and speaking and acting truthfully and with good intentions (Mihalicz, 2024). Like love, to live an honest life and be honest with others, we must first learn to be honest with ourselves. Honesty is about living authentically, keeping promises, and maintaining integrity in all aspects of life. It is said that to walk through life with integrity is to know honesty. According to Goyathlay (a.k.a. Geronimo),

> *"Honesty comes when you learn to be fearless with yourself. When you speak and act straight from the heart, the Creator will give you love and strength to say and do what is right for you in every moment. Innocence, curiosity and openness will keep you honest."*
> (David Bouchard, 2016)

Honesty is a path to healthy and harmonious living which is represented by the Sabe or the raven (N.A., N.D.). They teach us to speak from our hearts and be true to our word, to be honest with ourselves, to recognize and accept who we are, to accept and use the gifts we have been given, and not to deceive ourselves or others.

Dabaadendiziwin (Humility). Humility is about acknowledging that all beings are equally important and that we are all a sacred part of creation with a role to play. It involves recognizing our own limitations, being open to the wisdom and experiences of others, and not seeking to elevate ourselves above others (Mihalicz, 2024). It guides us to live respectfully and to maintain harmonious relationships with all of creation. Humility is represented by the wolf who lives its life for the good of the pack (N.A., N.D.). Wolves

are naturally both social and loyal and form life-long bonds with one another. They are known for their strong sense of community where each member has a role to play, and no one is considered above the other. They teach us to understand our strengths and our role in our families and communities and that acts of kindness are not charity to be rewarded but are rather a natural part of living in a community.

A.4.2.4.2 Living the Teachings

The Seven Grandfather Teachings are not rigid rules to follow but values that guide behaviour and decision-making. Each person's journey with these teachings is unique and can evolve over time. It's not about being told how to think or behave; it's about figuring that out for yourself and understanding what each one means to you in how you live your life (Mihalicz, 2024). The teachings themselves are not an end goal or finish line to strive towards. Living these teachings should be approached as a lifelong journey of learning, personal growth, and contribution to the wellbeing of others. it is important to understand that each of these teachings exists only in relationships and that all seven teachings are equal and interconnected. None of these teachings are more or less important than any other and you can't truly embody any of them without the others.

Ways of being in many communities are grounded in these seven teachings. Those who live these teachings do so in all aspects of life, including their careers. To this day, these teachings are built into the DNA of many Indigenous businesses and continue to guide decision making at every level of these organizations. Many have even gone so far as to incorporate them directly in their company mission, vision, and value statements.

> *"You tend to see strong value-based approaches. Different Indigenous people across different cultures will express them from everything from Grandfather Teachings to Medicine Wheels, but they tend to bring a holistic perspective. If they've been raised traditionally, they bring forward the teachings, they bring forward the values and they try to express those in terms of how they go about doing their business and how they go about serving customers and their communities."*
> (K. Lendsay, personal communication, January 25, 2022)

In general, these teachings promote ethical and sustainable business practices, a positive corporate culture, strong relationships with stakeholders, transparency and fairness, and ultimately foster cohesion and resilience (Verbos & Humphries, 2014). Businesses that live these teachings tend to make decisions based on the collective wisdom of their team and recognize the contributions of all who help make the business successful. They create respectful workplaces that value diversity and inclusion while treating employees, customers and the environment with kindness and respect.

"I think you'd be able to build much stronger business relationships if we all thought about everything we're doing with respect to the Seven Grandfather Teachings and for everyone to be open and honest." (T. Bull, personal communication, February 11, 2022)

A.4.3 Conclusion: Two Worlds Colliding

The value systems and worldviews commonly found in Indigenous and Western societies when combined with historical legacies, social conditions and geographical contexts have traditionally resulted in different and often opposing orientations (Braun et al., 2014; Peredo & McLean, 2013). The Seventh Generation Principle is one example of how Indigenous ways of being and doing oppose mainstream capitalism and political systems which prioritize short term gains over longer term benefits or sustainability. In these systems businesses are rewarded for rapid growth and politicians are celebrated for making consumption trade-offs by their constituents who demand ever-increasing standards of living, employment opportunities and job satisfaction. In long-term, mutualistic and community-oriented systems, businesses would instead grow together with those they serve and be rewarded for generating value that may not be realized for generations. Despite these and other benefits, a strong community orientation presents a unique set of challenges when operating within systems that are predominantly individualistic and capitalistic (Frederick & Henry, 2003; Peredo & McLean, 2013). For instance, they might struggle to access capital from lenders who demand exit strategies, liquidity, realized gains, and who have a fiduciary duty to serve shareholder interests. They may also face challenges stemming from the community itself. Businesses that are not aligned with their community's values may even be suppressed by the community (Lindsay, 2005).

People and organizations who are living the grandfather teachings or practicing other value-based systems of governance under colonial rule also presents challenges. Honesty and integrity are almost universally respected, yet they are penalized by criminal courts (Greenberg, 2000; Kern Griffin, 2018; Seidmann, 2005). Dishonesty, on the other hand, is rewarded and sometimes even expected in mainstream capitalist economies (Wiltermuth et al., 2015). Similarly, bold and brash behaviour is celebrated while humility is easily mistaken for weakness in competitive business landscapes.

Concepts of ownership also differed leading to the exploitation and theft of community resources. For example, knowledge was not considered something that can be created, owned or controlled, but rather as a community resource to be shared openly and with a spirit and purpose of its own. Another important example is the concept of land ownership. According to Elder Albert Marshall, *"Land [the natural world] has rights and humans have responsibility."* To many Indigenous Nations, land was not something that could be possessed or controlled, but rather something that sustains life and which was to be protected and nurtured. For some, particularly nomadic and sub-arctic peoples, the idea that they could be relegated to

small parcels of land indefinitely would likely have been such a foreign concept as to be practically inconceivable.

Since time immemorial, Indigenous peoples across Turtle Island developed unique worldviews and knowledge systems based on their own ways of knowing, learning, and teaching and guided by principles of respect, reciprocity, and mutualism. These Nations evolved in tandem with one another independently of the Western world and are often considered fundamentally incompatible with many of the ideologies and doctrines upon which mainstream capitalism, colonial governments and legal systems are based (Braun et al., 2014; Peredo & McLean, 2013). Examples of this include values-based systems of governance (Kotalik & Martin, 2016), collectivist and mutualistic mentalities (Vannini & Vannini, 2019), long-term (Joseph, 2018) and community orientations (Colbourne et al., 2017), systems thinking (Little Bear & Wilkins, 2004) and ecological perspectives (Kawagley & Barnhardt, 1998), continuous (Ross, 2009) and cyclical philosophies (M. A. Battiste & Little Bear, 2000), ontologies of interconnectedness (Little Bear, 2012; Peña, 2017), relational epistemologies (Pormon & Lejano, 2023), oral histories (Wiesner, 2021) and traditions of storytelling (Datta, 2018), and living knowledge systems (Whap, 2001). These differences do not align with mainstream capitalism, nor can they be expected to flourish under the weight of colonial power structures. These are a few examples of the incompatibility of Indigenous and Western societies; however, it is important to acknowledge the considerable diversity within both Indigenous and Western cultures. Moreover, these systems can and do influence each other.

Appendix 5 : Post-Contact Colonialism and Cultural Genocide

While the nature of interactions between Indigenous peoples and settler Europeans varied, trade often played a central role in shaping these relationships. Understanding the history of these early trade relationships provides valuable insight into the dynamics of Indigenous-European interactions and their impacts on North American societies. In many cases, early interactions were mutually beneficial collaborations marked by mutual curiosity, respect, reciprocity, intercultural understanding and cultural exchange. Early settlers depended on Indigenous peoples' knowledge of the land and establishing healthy trade relationships was often necessary for survival. In the early 17th century, for example, English loyalists at Jamestown relied heavily on trade with the Powhatan Confederacy to acquire food and other resources. Similarly, in 1620, groups of settlers in Plymouth depended on the Wampanoag for resources such as corn, fish and furs. Indigenous communities would often also share their technological, agricultural and medicinal knowledge giving early settlers the tools to thrive in these harsh and foreign environments (Durzan, 2009).

As European exploration expanded, the fur trade emerged as one of the most significant and enduring aspects of these trade relationships (Carlos & Lewis, 1999). European demand for beaver pelts created an extensive and profitable market for Indigenous trappers and hunters, who possessed the skills and knowledge to procure and prepare these furs. In exchange, they offered valuable European-made goods such as metal tools, weapons and textiles (Carlos & Lewis, 1999). The fur trade brought significant economic and social changes to Indigenous societies. It created new alliances, altered traditional subsistence patterns, introduced new material goods, and, in some cases, it exacerbated conflicts amongst Indigenous Nations who competed for access to European trade goods and hunting territories (Fisher, 1992; White, 1997).

A.5.1 Treaty Rights to Education

Throughout the 16th and 17th centuries, Indigenous and European Nations entered into agreements which were codified in Wampum belts which described their responsibilities towards one another and established guidelines for co-existence (Snyderman, 1954). Many of these treaty agreements were made in good faith and under constant threat of incursion by military forces in the present-day United States. At the time, the British military did not have the troops or resources to defend against these advances and depended on partnerships with Indigenous Nations already strategically located along the border to protect their interests (Belshaw, 2020). As such, some of these agreements were made under duress with military leaders whom

the Crown later claimed had no authority to act on its behalf. In 1763, King George III issued a royal proclamation which assumed control over such agreements by forbidding British subjects and colonial authorities to negotiate with Indigenous Nations. The Royal Proclamation of 1763 was hailed as a declaration of European sovereignty in North America and structured Indigenous-Crown relations for over a hundred years (Slattery, 2015). Eventually the borders stabilized, diplomacy strengthened international relations and the military developed the capacity to mobilize troops much faster (Hoy, 2021). This decreased reliance on Indigenous Nations changed the nature of their relationships and treaty agreements in became more transactional and predatory.

A.5.2 Destabilization and Assimilation

As decades and centuries passed, these once mutually beneficial relationships turned adversarial, and Indigenous Nations were eventually treated as obstacles to the government's vision for Canada (Colbourne et al., 2024). They saw Indigenous culture as a threat to colonialism and used all tools at its disposal to eradicate Indigenous culture (Ross, 2009). Indigenous peoples were confronted with mass depopulation due to wars and disease (Cameron et al., 2015; Fenn, 2000), dispossession of land (Samson, 2016), social isolation (Samuel et al., 2018), and forced economic dependence (Gagné & Danieli, 1998; Ojha, 2003). European-introduced diseases decimated Indigenous populations which had little immunity to foreign pathogens, while oppressive laws designed to displace and disrupt wreaked havoc on social constructs (Edwards & Kelton, 2020). Following the Canadian Confederation in on July 1, 1867, the GoC formally declared legal ownership of all lands within the current borders and legislative jurisdiction over both "Indians and Lands Reserved for Indians" (Stevenson, 2002). Programs implemented by various governments throughout North America to systematically eradicate Indigenous cultures are some of the most well documented examples of cultural and utilitarian genocide (Amir, 2018; R. W. Smith, 1999). The assimilation process began with the destabilization of Indigenous society which sought to remove power from community leaders and fracture social, political, cultural and economic institutions.

While much of it was planned and deliberate, the destabilization of Indigenous societies began unwittingly long before any coordinated efforts. When French missionaries first arrived in the 1600s, they introduced venereal disease, tuberculosis, smallpox, influenza and measles to a virgin population with no developed immunities. Some estimate half of the Indigenous population perished which contributed substantially to the disruption of knowledge systems and loss of identity (Coates & Morrison, 1996). First, like most diseases the elderly and the young were most affected. In traditional Indigenous family structures, a child's parents were the providers while the Elders were responsible for passing on cultural traditions, experiences and life skills to the young. This meant that there were few left to receive the teachings and even fewer left to teach them. Second, as disease spread, members began turning to Christianity either for salvation, to gain

acceptance, or to improve trade relations with European settlers. This was exacerbated by Jesuit missionaries who emphasized the incompatibility of the two and Indigenous Christians stopped participating in the cultural traditions that once held their communities together.

A.5.3 The Indian Act

The Indian Act was first passed on April 12, 1876 by the Parliament of Canada in accordance with the Constitution Act of 1867 (Indian Act, 1876). This Act stands as the most significant barrier to economic stability, self-sufficiency and economic independence in modern history for Indigenous Nations (T. Flanagan, 2022). It effectively institutionalized racism in Canada and resulted in the psychological, emotional and spiritual marginalization of Indigenous peoples (Martin, 2000). It made it illegal to hire lawyers or seek legal counsel, trade off-reserve without prior permission, as well as manage their own lands, finances and resources (Joseph, 2018). It also criminalized much of what it means to be Indigenous today and effectively fostered a culture in Canada that "others" and denigrates Indigenous peoples and culture. One of the most enduring impacts of the Indian Act has been the forced economic dependence of Indigenous peoples on the GoC. The Indian Act was not just used to destabilize and disenfranchise; it was designed to phase out Indigenous identity and served as a tool to assume control over various aspects of their lives and livelihoods. It was the first of many laws to follow that would erode Indigenous political, economic, social, and cultural institutions eventually leading to chronic psychological distress and a host of challenging life circumstances (Martel et al., 2011).

A.5.3.1 Systems of Governance

One of the more significant actions in the imposition of European power structures on the Indigenous population was the centralization of Indian Affairs under the Crown. This granted them the authority to require that all Indigenous diplomacy and trade served their interests (Shannon, 2002). Chiefs were no longer allowed to lead their Nations and were granted authority over only menial decisions in accordance with government regulations. Moreover, it made gathering in groups of more than three illegal, effectively criminalizing self-governance and collective action (Joseph, 2018). This was made possible through the Indian Band system created to replace traditional systems of governance. These bands were controlled by Indian Agents hired by the GoC to serve its interests. Indian agents were given exclusive authority to make all decisions of consequence, set meeting agendas, chair meetings and speak on behalf of their assigned communities (Sutherland, 2002). With the disempowerment of traditional forms of leadership and governance, solidarity was fractured and communities left fragmented (Milward, 2011).

Accompanying these laws were more laws that prevented Indigenous people from contesting any of the GoC's decisions. They could not bring the GoC to court without the government's own permission and were forbidden from taking grievances to the Queen (Sutherland, 2002). Furthermore, Indigenous peoples were not allowed to vote and could be arrested for conspiracy for even discussing grievances. This placed the government in a position of absolute authority over Indigenous Nations to promote their interests with impunity. Sutherland describes this situation as an extreme form of a whitestream legal system being used to oppress a race of people for the purposes of economic exploitation (Sutherland, 2002).

A.5.3.2 Forced Economic Dependence

Coupled with the band system, was the establishment of a reserve system that confined Indigenous peoples to small, often remote, parcels of land and limited their access to the resources necessary for traditional economic activities such as hunting, fishing and trapping (Joseph, 2018). It is important to understand that these reserves were never intended to be permanent, self-sufficient or self-governing. They were created as a temporary measure until such time as all Indigenous peoples could be assimilated and disenfranchised. A later provision of the Indian Act also prohibited Indigenous peoples from retaining legal counsel to defend their rights and economic interests remained in effect from 1927 until 1951 (Swiffen, 2022). This provision was enacted when Indigenous rights were intensely disputed and served to prevent Nations from pursuing land claims. To this day, many of the unresolved land claim disputes can be traced back to this period when Indigenous peoples were barred from seeking legal redress.

The Act also restricted the ability of Indigenous peoples to engage in trade and commerce, further contributing to their reliance on governments and missions. The implementation of a pass system meant that those living on reserves needed the Indian Agent's permission to leave the reserve for any reason (Joseph, 2018). This pass system was instrumental in assuming control over the economic activities that these Nations engaged in and the extent to which they were able to participate in the Canadian economy. Laws made it illegal to enter into contracts, sell anything produced or manufactured in their territories without government approval (Sutherland, 2002). With not enough land to sustain the communities these laws forbid Indigenous peoples from engaging in any remaining activities that could lead to economic independence. Many ultimately resorted to selling land for survival which further shrank their lands and with it any hope for restoring self-sufficiency.

The geographical confinement and racial segregation induced feelings of powerlessness, meaninglessness, normlessness, isolation and self-estrangement (Martin, 2000). Additionally, there was widespread confusion in those left to navigate life between two cultures whose worldviews and approaches to justice were diametrically opposed. Further exacerbating the massive casualties and religious divides was a

growing dependence on political gifts and an over-reliance on European products. Alcohol proved most detrimental to Indigenous lifestyles and self-sufficiency, though communities grew increasingly dependent on many other items that they didn't have the ability to make or repair.

A.5.3.3 Overincarceration

The Crown cemented its power over Indigenous Nations through a series of discriminatory laws that delegitimized Indigenous social institutions and destroyed their ability to self-govern and live independently (Martel et al., 2011). In 1895, all Indigenous peoples were declared subjects of the Queen and expected to obey her laws. They then enacted a series of discriminatory laws which gave them the power to imprison non-conformists (Coates & Morrison, 1996). Indigenous peoples were generally regarded by the Euro-Canadian society as innately uncivilized and inferior, but worthy of salvation. The use of discriminatory laws and corporal punishment together with notions of social justice and religious salvation forged the criminal justice system into a particularly effective instrument to both assimilate Indigenous peoples and spread Christianity.

In their efforts to encourage settler migration to rural areas that many felt were lawless and unsafe governments went to great lengths to track down and punish those suspected of committing crimes. In one case, a force of over four hundred men were sent to execute a First Nations man who wounded a British subject for attempting to seduce his spouse (Brazier, 2000). Other examples of the criminal justice system being used to serve assimilationist agendas was the criminalization of cultural practices like wearing regalia (Sutherland, 2002) and ceremonies such as the Sundance and Potlatch made illegal from 1885 until the mid-1900s (Backhouse, 1999; Pettipas, 1994). Importantly, the Potlach was a ceremony of gift giving common throughout the pacific northwest which also served as wealth-distribution systems and stores of value in the form of relationships (Loo, 1992). In response to growing concerns over alcoholism, governments made it illegal to possess or consume alcohol which contributed to the social exclusion and over-incarceration of Indigenous peoples.

The incarceration of Indigenous peoples served not only to neutralize the material and symbolic threat of opposing worldviews but also gave them the opportunity to assimilate prisoners while incarcerated. One example was Klatsassan and four of his warriors who were sentenced to death for their role in the Chilcotin (Tsilhqot'in) uprising (Hewlett, 1976). As they awaited their execution, they were visited daily by a Church of England clergyman who worked with a translator to convert the warriors before their sentences were carried out (Brown, 1873).

A.5.4 The Residential School System

In the mid-19th century, there was strong political pressure for mandatory schooling for children, but little public support (*RCAP*, 1996b). The public school system at the time wasn't considered effective and Canadians largely opposed the idea due to the cost and because many needed their children to help out around the house. Though largely excluded from Canadian society, Indigenous communities were involved in these discussions. Many called on the government to honour its treaty obligation and make education available to their children, but there was little support from politicians or society to pay for it. This paved the way for the industrial school model proposed by Egerton Ryerson, a Toronto-based writer, educator, politician and Methodist minister (Semple, 2024). The proposed model would allow for income generated through child labour to help pay for the schools and would eventually lay the foundation for the infamous residential school system (RCAP, 1996a; SSTF, 2021; TRC, 2015b).

In 1847, Ryerson published a report recommending the establishment of Industrial Schools which he claimed was for the benefit of Indigenous children (Ryerson, 1847). In it, he proposed that there be a separate school for Indigenous children providing limited intellectual training and instead focusing on industrial agriculture and kitchen skills training which was not consistent with the needs or wishes of communities. He also recommended that children be intentionally separated from their parents and communities and that Christianity be used as a tool to civilize these children.

> *"[...] the North American Indian cannot be civilised or preserved in a state of civilization without the aid except in connection with, if not by the influence of, not only religious instruction and sentiment, but of religious feelings."*
> (Ryerson, 1847)

The industrial schools model was eventually piloted in Alderville in 1848 and the Mount Elgin School at Muncey in 1851 (N.A., 2025b). In 1858, a commission appointed to investigate Indian Affairs in Canada concluded that the schools failed due to the late age of pupils, short attendance, parental prejudice against the schools, and a lack of funding. Children were also not found to be applying any of their training when they were returned to their communities.

A.5.4.1 The Effects of the Residential School System

These institutions were designed to remove children from parental influences believing that it would make them more impressionable and accepting of Christian values and beliefs. Like corporal punishment in prisons, school administrators would regularly use violence against children who refused or struggled to

conform (*RCAP*, 1996b). Instances of corporal punishment were rare in Indigenous households and many of these children attempted to escape (Barnes et al., 2006). Most were recaptured. Some made it home. And the rest were never heard from again.

> *"In 1943, R. Hoey, the department's superintendent of welfare and training, on receiving from the principal of St. George's School a set of shackles that had been used routinely "to chain runaways to the bed" and reports of other abuses at the school, wrote, "I can understand now why there appears to be such a widespread prejudice on the part of the [First Nations] against residential schools. Such memories do not fade out of the human consciousness very rapidly."*
> (*RCAP*, 1996b)

These discoveries are as much of a reminder of the devastation caused by the RSS as they are of the amount of work left in uncovering the truth of Canada's past and the intergenerational trauma that continues to plague Indigenous Nations and communities. As shocking as these discoveries may have been to most Canadians, it comes as no surprise to those who grew up hearing the stories. Most of these children survived to tell the story. The stories of those who didn't are now being told and their voices are heard around the world.

> *"Violations of solemn promises in the treaties, inhumane conditions in residential schools, the uprooting of whole communities, the denial of rights and respect to patriotic Aboriginal veterans of two world wars, and the great injustices and small indignities inflicted by administration of the Indian Act—all take on mythic power to symbolize present experiences of unrelenting injustice."*
> (*RCAP*, 1996b)

A.5.5 Economic Reconciliation

The cumulative effects of the historical and ongoing violences committed against Indigenous Nations are immeasurable. These violences now manifest as a series of contemporary issues within communities making Indigenous peoples in Canada one of the most disadvantaged populations in North America. In recent years, there have been efforts to reform the Indian Act and address its harmful legacy, though its ongoing impacts remain a significant challenge. Addressing this issue requires a commitment to dismantling the Act's oppressive policies, acknowledging its historical and contemporary impacts, and supporting Indigenous-led initiatives that promote self-determination, self-governance and economic self-sufficiency. In 2021, the GoC passed a bill which sets out a framework to implement the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (Fryer & Leblanc-Laurendeau, 2002). By committing to uphold these principles, the GoC recognizes and affirms the rights of Indigenous Nations to

self-determination, land, resources and cultural preservation (Borrows et al., 2019). This commitment helps to pave the way for a more supportive and inclusive environment for Indigenous Nations in Canada. It signals a step towards enabling these Nations to play a more significant role in shaping their economic futures while contributing to the diversity and prosperity of Canada's economy.

Additionally, some of these Nations have entered into modern treaties and self-government agreements which aim to provide greater autonomy and control over their economic development. Importantly, Indigenous-led businesses now operate within a legal framework that respects their rights to pursue economic activities in accordance with their values and traditions. Moreover, the recognition of the rights of these Nations to control and benefit from their land and resources creates new opportunities. The recent surge in partnerships between Indigenous Nations and Canadian organizations and is promising, with shared ownership of large capital projects quickly replacing impact benefit agreements as the new normal (Bledsoe, 2022; Kung et al., 2022).

Today, the Indigenous economy is contributing to economic growth, sustainable development, and cultural revitalization across various sectors and regions in Canada (Dana, 2015). Indigenous businesses have become significant contributors to economic growth and employment, both within their Nations and across Canada. Their contributions to Canada’s Gross Domestic Product grew from $41.7 B in 2012 to $48.9 B in 2020, much of which is attributable to Indigenous-led businesses (Statistics Canada, 2023a). In 2021, these businesses contributed nearly $32 B and estimates suggest that it has the potential to grow much larger (Ayotte & Bridger, 2022; Hilton, 2021).

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