

Speaking Scientifically: The Role of Communication in the Translation of Novel Brain Science
Research into Policy

By

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ABSTRACT

This project examines how addiction and mental health policy comes to incorporate novel research findings from brain and neurosciences by asking: “What role does communication play in the translation of research into policy?” I use a multiple case design to compare and contrast varying communication patterns involved in the translation of three distinct sets of research findings. Each of the three cases in the dissertation stem from similar, but distinct sets of research findings from brain science, and have been translated into policy to varying degrees, with noticeably different translation paths. These varying patterns of translation are demonstrated in the ways research concepts and terminology are included and communicated within policy documents. My research reveals that communication tools are employed in different ways across the three cases. Analysis was guided by the SPEAKING model from speech code theory in order to systematically analyze and examine policy documents published by Alberta government ministries from 1990 to the present. 1990 marked the beginning of the ‘decade of the brain’, when technological ideas allowed for greatly enhanced brain imaging techniques. From that point forward, researchers became increasingly able to map out and pinpoint various neural pathways and brain regions associated with conditions like addiction and mental illness. Since government policy documents are carefully constructed because they are intended to guide and govern practices on a field level, they serve as an important record over time. In Alberta, these documents are produced by government ministries that are responsible for planning, developing and managing government-operated affairs, including health care and education. Through systematic analysis of policy documents related to each of the cases, I found that the three sets of brain research findings varied in how and to what degree they were translated into addiction and mental health policy. Further, the communication patterns exhibited by each of the cases differed in how these research findings were conveyed.

In the first case (ACEs), initial research findings from Felitti et al. (1998) revealed that adverse childhood experiences, such as toxic stress, negatively impact lifelong neurobiology and health. My analyses show that specific scientific terms and concepts were quickly imported into policy. Then after a series of concerted efforts to bring together multidisciplinary groups and construct a common ground for public discussion of addiction and mental health concerns, metaphors and narratives were increasingly and consistently employed within policy documents. Over time, these metaphors and narratives came to replace, and stand for, the initial research concepts. In the second case (Origins of Addiction), based on research demonstrating that addiction is a chronic disease of the brain (e.g. Koob & Moal, 1997; Koob, Sanna & Bloom, 1998), there was initially less clarity and more widespread variation in the terms and explanations used to describe the novel research findings. Following several multidisciplinary conferences dedicated to the topic, the concept of specific brain origins of addiction became increasingly accepted; however, documents continued to rely on a variety of explanations to communicate the research findings. Over time, the same metaphors used to explain ACEs research gradually became standardly used to describe research findings regarding the origins of addiction. In the third case (Concurrent Disorders), based on research showing that neuropathways associated with addiction were similar to those associated with mental health disorders (e.g. Markou, Kosten & Koob (1998), there was little inclusion of brain science research terminology. Instead, and throughout the time span of my analyses, general explanations about similarities between addictions and mental health disorders were provided. Further, information on concurrent disorders was often communicated in documents as part of justification for actions regarding other, different policy issues, rather than issues dealing

specifically with concurrent disorders. Then, the topic of concurrent disorders disappeared completely from policy.

In comparing the communication patterns constituting different dynamic translation processes, I firstly contribute to the literature on translation by developing a process model to show how the deliberate and careful construction of metaphors can act as a robust mechanism for facilitating the travel of ideas between contexts. Secondly, I contribute to this body of scholarship by explicating the nature of editing rules and how they operate in relation to one another during the translation process. Thirdly, I provide a more nuanced explication of the general patterns of communication underlying the translation of knowledge from one context into another. By examining the usage and explanations of research findings across cases, my analyses reveal how communication patterns can constitute different dynamic translation processes. Overall, my research shows that processes of translation can be deployed through specific ways of communicating, and that the ways in which research concepts are explained and edited over time can be accomplished through construction of language that resonates with local audiences to realign perceptions and establish common understandings.

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CHAPTER I: INTRODUCTION

How do ideas travel from one context to another? This question is of practical as well as theoretical importance in aiming to understand the emergence of research knowledge, its implementation and ability to address real world issues. It highlights the importance of understanding how to bridge such gaps in knowledge generation and its successful incorporation within and between fields. The nature of the spread of knowledge and ideas, particularly between fields, has garnered increased focus by institutional and organizational scholars. In particular, scholarship on translation has gained prominence over the past few decades (Wæraas & Sataøen, 2014; Lamb & Currie 2012; Sahlin-Andersson, 1996).

The concept of translation, the negotiation of meanings and interpretations between and within social groups (Czarniawska & Sevón, 1996), is an important concept in understanding the spread of ideas between fields, for example between scientific, policy and practice communities. Relatedly, innovative scientific knowledge and research has the potential to address several social and human needs and to improve living standards and outcomes in their application as novel ideas spread, or are translated, from innovators and researchers to other domains and fields. However, the translation of new knowledge from one field into another is a complex process that lacks straightforwardness in understanding how to strategically implement and communicate these ideas in meaningful ways that effectively meet societal needs and substantively improve outcomes. Thus, in this study, I address the need to more fully understand the communicative processes and patterns underlying efforts to translate novel research ideas and knowledge from one context, brain science, into another, policy surrounding addiction and mental health.

Scandinavian institutionalists (e.g., Czarniawska & Jeorges, 1996), in particular, have attended to the processual and dynamic variations that arise as ideas and practices travel from one setting into another. For actors in local settings to make sense of and use ideas, they must be framed within local vernaculars (Malets & Zajac, 2014). Due to this local framing during the spread of practices (Lounsbury & Crumley, 2007), local variations emerge (Ansari, Fiss & Zajac, 2010; Saka, 2004). Studies of how knowledge is adopted and implemented have thus highlighted two primary aspects of translation: agency (e.g., Ansari et al., 2010; Malets & Zajac, 2014) and local variations (e.g., Czarniawska & Sevon, 2005; Fredriksson, 2014). Also highlighted has been an interesting juxtaposition: while translation is often creative, uncertain or unpredictable (Latour, 1987; Sahlin & Wedlin, 2008; Tracey, Dalpiaz & Phillips, 2018), it is also subject to rule-like regularities (Røvik, 2016; Wæraas & Sataøen, 2014).

To date, scholars have attended to multiple driving forces of translation and change, such as field configuring events (e.g., Hardy & Maguire, 2010; Lampel & Meyer, 2008), complex social challenges (Mair, Wolf & Seelos, 2016), regulation (Djelic & Sahlin, 2008) and powerful skilled actors (Sherer & Lee, 2002), including experts and professionals (e.g., Greenwood, Suddaby, & Hinings, 2002). Concerning the impetus for translation of practices to occur as they travel from one setting to another, scholarly work points to the tension between the activities involved in the movement of ideas from one context into another (Sahlin & Wedlin, 2008) and simultaneous construction of similarity and difference (Røvik, 2016). Researchers further indicate that the same idea or practice can produce drastically different adoption outcomes within different contextual settings. In the mental health field, for example, the use of methadone in heroin

addiction treatment underwent very different implementation paths in both U.S. and Swedish contexts (Johnson & Hagstom, 2005).

Arising from an increased focus upon organizational practice (Boxenbaum & Jonsson, 2008), translation scholars emphasize both symbolic aspects of institutionalism and how ideas travel across organizational boundaries (Sahlin & Wedlin, 2006). While extant literature has established the important role of translation in the spread of ideas from one field to another, relatively little is known about how and why the process of translation occurs. Much scholarship has attended to symbolic, linguistic and material aspects underlying and facilitating the spread of ideas. Ideas and practices from one context, characterized by its own set of historical, cultural and social norms, must undergo various forms of meaning work (Rao & Giorgi, 2006) in order for them to make sense and resonate locally (Tracey et al., 2018), and ultimately be realized within a different context. Previous research has highlighted the importance of creating resonance through various communication forms, such as stories of success (Tracey et al., 2018), scaffolding to enable and organize transformation (Mair, Wolf & Seelos, 2016) and deliberate, conscious and reflective discourse (Gondo & Amis, 2013) surrounding successful change implementation. Additionally, previous research indicates that, in order to integrate new practices or ideas into a context, local actors must translate them into their own languages, meanings, and practices in order to identify with and integrate them as their own (Becker-Ritterspach, Saka-Helmhout & Hotho, 2010).

Despite the assertion that communication and language play a fundamental role in translation processes, we know little about the patterns of such activities. For instance, scholars have rarely

explored the patterns of communication practices and processes through which translation occurs, despite the assertion of translation being a rule-bound activity (Wedlin & Sahlin, 2017) that is inherently facilitated via communication practices. Understanding this is of practical, as well as theoretical, importance due to the significant social and economic implications that can result from the translation of ideas as they spread from field to field and incite various changes, including policy change governing practices. In summary, although much research has aimed to explicate the various antecedents and consequences of translation, little is known regarding the dynamics of social and communicative interactions that are intrinsic to translation activities. Given that translation is deemed an open, but rule-bound activity (Wedlin & Sahlin, 2017), it is surprising that little research has yet delved into the patterned communication practices that underlie this process. Further, while much scholarship has delved into various linguistic and discursive artefacts involved in institutional processes of translation (e.g., Christensen & Cornelissen, 2015; Czanrnawska & Joerges, 1988; Outila, Piekkari, Mihailova & Angouri, 2021; Zilber, 2006), we know little about how they operate alongside other elements of communication to facilitate or hinder this process. Thus, I aim to provide a deep and descriptive explanation of communication processes and patterns underlying the translation of novel scientific knowledge into policy change within a field.

This study addresses the need for greater understanding of the communication patterns and processes underlying the translation of ideas and practices from one field to another. Previous scholars, such as Ocasio et al. (2015), point out that translation processes are particularly important in communications, or vocabularies, that span fields, as they extend the scope of meanings and increase the applicability of ideas and practices across contexts. As

communication theorists commonly agree, multiple variations in communication exist within and between groups, communities, and cultures. Thus, in bridging scientific knowledge and field level policy change, these variable meaning systems are brought together, negotiated, contested and realized through communicative activity.

The communications literature provides a rich toolkit for understanding how new knowledge comes to be translated into policy because many communications scholars have foregrounded the fact that multiple speech codes or variants can exist in a cultural domain, enabling actors to contest and construct meaning via interaction with one another (e.g., Bakhtin, 1981; Bernstein, 1971; Orbe, 1998; Searle, 1965). For example, Bakhtin (1981) proposes that language is stratified into various genres and jargons, and that individuals must consciously and strategically select which to use, actively orientating themselves in response to others. Similarly, Orbe (1998) contends that multiple cultures, or co-cultures, co-exist within a given society, and can strategically utilize forms of communication to achieve various ends. Variations in communication arise from the appropriation of various forms of speech codes, and can lead to differential orders of meaning (Bernstein, 1971; 1981). Thus, regarding the spread and adoption of ideas, it becomes important to understand how different organizational actors communicate ideas in terms of what is already locally normatively accepted as valued and valid in an effort to translate them into policies guiding local field level practice and idea change.

Although communication processes lay the foundation for social negotiations of meaning, in studies to date, communication is often implicitly understood as underlying translation activities (see Ocasio et al., 2015). Communication is inherent in understandings of how ideas travel via

negotiations of meaning between the source and local contexts. Yet, the patterns of communication practices underlying translation processes remain largely under specified. This is surprising, given that empirical inquiry into the nature of these processes can lend valuable insight into the dynamics upon which translation activities are rooted within historical, cultural and social characteristics of originating and target contexts. Even as scholars such as Ocasio et al. (2015) define translation as rhetorical and collaborative, there is much left to be understood in terms of the dynamics of communicative mechanisms that provide the foundations for policy developments and can, in effect, facilitate or hinder translation efforts. Translation theories could thus benefit greatly from adopting and integrating established and relevant perspectives from communication theories that specifically attend to the patterned characteristics of communication practices. By empirically examining the communication patterns found within policy documents and communications of government ministries over time, this study provides insight into the real-life efforts involved in translating novel scientific research into meaningful policy change on a field level. Thus, I aim to address the following research question: What is the role of communication in the translation of novel scientific research findings into policy?

Policymakers in the field of addiction and mental health have continually encountered remarkable difficulty in being able to uptake new knowledge from neuro and brain sciences. Thus, policymakers in the field have also encountered difficulty in implementing available, innovative scientific research into both policy and practice. By examining the communication patterns that constitute efforts to translate brain and neuroscience into mental health treatment, prevention and intervention policies and practices, interesting insights can be gained into the mechanisms underlying the translation of ideas from one context to another. In analyzing the

communication processes and patterns underlying the translation of brain and neuroscience into policies within the field of addiction and mental health, I contribute a more nuanced explanation of the dynamic ways of communicating that underlie aspects of translation processes.

Since the 1990s, known as the ‘decade of the brain’, greatly refined and enhanced neuroimaging techniques have allowed for visual representation and mapping of the brain that enable greater understanding of the cognitive mechanisms and structures that underlie addiction and mental illness. However, much of this research is only just recently coming within the purview of policymakers and practitioners in this field. This is especially interesting given the vast, historical costs, both socially and economically, of mental health and addiction. For 2021-2022 alone, the operating budget for the Alberta Health department allocated to mental health and addiction is over \$140 million dollars (AHS, 2021/2022). This is, therefore, a highly appropriate case from which to gain important insights about the travel of idea from scientific ideas into field level policy. This case is particularly relevant given that the translation activities involved in this setting are explicitly undertaken by a range of institutions, organizations, and groups across multiple levels (e.g. federal, provincial and regional). This study thus addresses a gap in the translation literature by explicating the longitudinal and ongoing communicative dynamics of translation as novel research is brought into policy by government ministries over time.

To conduct my dissertation research, I gathered data to understand the communication patterns underlying translation processes. My data sources consisted of a large collection of policy documents produced in Alberta, Canada, including archival and documentary data. These documents produced by Alberta government ministries include publicly available addiction and

mental health national legislation and policies; provincial regulatory acts and initiative documentation; as well as ministry published routine newsletter and magazine communications surrounding on-the-ground prevention and treatment practices. These texts have been analyzed via the SPEAKING grid (Hymes, 1974) from speech code theory and methodology, and date from 1990 to 2021. 1990 onward marks an important period in which significant advances in neuro and brain science resulted in extensive, evidence-based understandings of mental health and addiction as fundamentally being conditions of the brain. The integration of this data with the methods and theories from communication theory, specifically those of speech code theorists (e.g., Bernstein, 1971; Hymes, 1974), allows for a descriptive explanation, as well as important contextualization, of the communication patterns underlying translation activities as novel research knowledge travels into Alberta policy.

This study makes three notable contributions to the scholarly literature on translation theory by integrating methods and theory from the communications scholarship on speech codes. This allowed me to focus on the construction of text as an important factor in the translation of knowledge and reveal the ways in which metaphors are used as part of this process. In terms of theoretical contributions, firstly I show that metaphors are an important and robust mechanism of translation. However, in order for effective construction and communication of metaphors that both appeal to local audiences and remain true to their original contexts, I find that they must be competently, coherently and consistently employed in a variety of types of communication for consumption by widespread and various audiences. Secondly, I explicate the nature of editing rules, and how they operate in relation to one another, and as part of translation more generally. Thirdly, I contribute by providing a more nuanced explanation of communication processes and

patterns constituting the circulation and travel of ideas. Overall, in this study, I demonstrate that translation requires communicative competence to skillfully enact editing rules and effectively translate new knowledge and ideas from one context into another in such a way as to adequately represent the meanings from their original context. In addition to its theoretical contributions, this project also contributes to improving knowledge about how policymakers can ‘bridge the gap’ between science and implementation, directing attention to the important role that communication plays during this process. By attending to the patterned communication practices involved in translation processes, those wishing to facilitate the travel of ideas from one context into another can do so with deliberate and competent communicative effort.

CHAPTER II: THEORETICAL DEVELOPMENT

In this dissertation, I examine the role of communication in the translation of novel, emergent research into government policy. The Scandinavian institutional approach to understanding translation emphasizes the dynamic processual and contextual aspects of the travel of ideas from one context to another (Czarniawska & Sevón, 1996; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). Much of the focus of this branch of literature is upon the local variations that arise when ideas are transported from one context to another. While there is extant acknowledgement of the rule bound nature of these local variations (Rovik, 2016; Sahlin-Andersson, 1996; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017), not enough is known about what constitutes these rules and how they are enacted throughout the translation process over time. Additionally, despite the discursive turn in institutional theory (Phillips, Lawrence & Hardy, 2004), and the more implicit discussions of communication processes in translation studies, little work has been done to understand the underlying communicative patterns of translation as ideas are transported between contexts as they occur in situ. While there is much discussion of the editing rules that guide translation activities, only a few scholars delve into what communicative patterns constitute these rules and how they are employed (e.g., Øygarden & Mikkelsen, 2020; Fredriksson, Olsson & Pallas, 2014; Kjeldsen, 2013). Therefore, I aim to address this gap by integrating communication and translation theories in order to provide a deeper explanation of how translation unfolds, with a particular focus on understanding the patterns of communicative dynamics constituting editing rules.

Translation

Translation, which entails the dynamic communication processes underlying the spread of ideas and practices, is defined as a process whereby “chains of organizations and their agents imitate

each other, create inexact translations of the ideas, objects, and practices travelling down these imitation chains” (Czarnizwska & Sevon, 1996: 220). The notion of translation extends historical diffusion views, in which knowledge transfer occurs in relatively linear, sequential stages that actors more or less passively either adopt or fail to adopt (e.g., Rogers, 1983;1995). Instead, translation scholars emphasize the embeddedness and constructive nature of local variations and micro-processes that occur as ideas undergo mediations and editing processes during their metaphorical travel through time and space (e.g., Lamb & Currie, 2012; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). In what follows, I detail the terms that have been used to explain translation, as well as its dis-embedding and re-embedding aspects. In addition, I outline the communication theories of speech codes and dialogism as they relate to translation activities. In describing translation as ‘travel’ and ‘circulation’, scholars have directed attention to the pressures or *forces* driving *flow*, the circuits or *pathway* taken, and the actual *objects* that are undergoing movement. In order to spread, ideas and practices must *flow*, representing the dis-embedding and re-embedding aspects of translation, or the initial exclusion of specific time and space bound characteristics of the original context from an idea, and the subsequent extension of an idea from one setting to another via its local interpretation and understanding (Czarniawska, 2004; 2009; 2010; Czarniawska & Joerges, 1996; Giddens, 1991; Sahlin-Andersson, 1996). When particular ideas are taken from one context, or dis-embedded, they are adapted and modified to fit within another, becoming quasi-objects as they enter local environments (Giddens, 1991; Czarniawska & Joerges, 1996). Ideas are then re-embedded within local settings through context-specific additions and alterations to meaning that work to repackage the idea from another context, and temporal and spatial characteristics are again added as important characteristics within the new setting (Sahlin-Andersson, 1996). Ansari et al. (2010: pp. 71)

define this sort of adaptation as the creation of “a better fit between an external practice and the adopters’ particular needs to increase its ‘zone of acceptance’ during implementation”. The negotiations and adaptations necessary for ideas to adapt to and fit within local contexts are what constitutes the flow of translation. In order for ideas and practices to flow, or move between, localized contexts, they must be interpreted in meaningful ways by various social groups. While there is an open-ended unpredictability inherent in local translations, rules of context, logic and formulation guide how ideas are circulated and moved between contexts, and rather than being explicit rules, are implicit templates that reveal how translation of ideas occurs (Sahlin-Andersson, 1996).

Driving *forces* of translation activity and flow between contexts include the strategic deployment of language and rhetoric to persuade various audiences of the appropriateness of particular ideas and practices (Lawrence & Suddaby, 2006; Lounsbury & Glynn, 2001; Suddaby & Greenwood, 2005). Other forces include regulatory legislation (Edelman, 1992; Hampel, Lawrence & Tracey, 2017; Djelic & Sahlin-Andersson, 2006; Levi-Faur, 2005), powerful or elite actors (Fligstein, 1985; Lawrence and Suddaby, 2006; Leblebici, Salancik, Copay and King, 1991; Lounsbury and Glynn, 2001; Marquis; 2003) and influential events (Bail 2012; Davis, 1991; Wahlström & Sundberg, 2018; Rueschemeyer and Stephens 1997). Fashions and fads act as a “steering wheel” that direct the flow of translation (Czarniawska & Sevon, 2005) and create models of appropriateness for translation processes. Carriers have often been used to describe actors who both actively and passively circulate ideas (Sahlin-Andersson & Engwall, 2002). As interactions between carriers intensify, channels become more open for the translation of ideas. Actorhood, while guided by interests and identities, is embedded within social construction processes

(Brunsson & Sahlin-Anderson, 2000), and “soft actors” facilitate translation in relation to local and social contexts (Czarniawska & Wedlin, 2008; Meyer, 1996).

Networks and social group compositions of organizations and their actors are frequently used to explain the *pathways* of idea and practice flows (e.g., Abrahamson & Rosenkopf, 1997; Burt, 1997; Rao, Monin and Durand, 2003). These actively constructed routes of travel (Czarniawska & Sevón, 1996) are interconnections and networks of contacts, actors and carriers that facilitate the travel of ideas through “complex webs of imitation processes” (Wedlin & Sahlin, 2017: 111). Characteristics of these routes and pathways can help or hinder translation processes via dynamic interactions and interrelationships between ideas, actors and environments. For example, Ferlie et al. (2005) showed that within multi-professional communities, strong boundaries between professions inhibited the spread of knowledge between boundaries, creating a stickiness that hinders the spread of idea. In networks based on shared common values, change was more easily facilitated and adopted, but in more diverse networks characterized by multiplicity and strong professional boundaries between groups, much more effort is required to facilitate change (Ferlie et al., 2005).

Objects of translation and spread vary in abstractness from organizational identities (Czarniawska, 2005) and shareholder ideals (Meyer & Höllerer, 2010) to more concrete organizational and managerial and risk regulation practices (Guler, Guillen, Macpherson, 2002; Czarniawska, 2011) and organizational structures (e.g., Fligstein, 1985). To illustrate, total quality management (TQM) models that were associated with success were adopted by organizations aiming toward identities aligned with success (Westphal et al., 1997). Accounting

and budgeting reforms in different countries utilized similar discourses, but underwent variable translations of concepts in their adoption (Hyndeman et al., 2014). In light of the extent of objects that may undergo translation, it is important to note that it is not the actual practice or idea that is transferred, “but rather accounts and materializations of a certain idea or practice” (Sahlin & Wedlin, 2008, p. 225). These accounts, to be theorized, legitimated and appropriated, must conform to existing historical and social systems of norms and values, and adhere to localized standards of appropriateness (Sahlin & Wedlin, 2008; Waeraas & Nielsen, 2016; Wedlin & Sahlin, 2017).

Editing Rules and the Dis-embedding and Re-embedding Aspects of Translation

Norms and standards of appropriateness are defined by contextual cues, wherein actors, the meanings they espouse, and their identities, interests and motives are socially constructed. ‘Editing rules’ (Sahlin & Wedlin, 2008) are implicit, rather than formal and explicit, guides for situational behaviour that stem from broader norms surrounding specific contexts (Sahlin-Andersson, 1996), and are indicative of the role of social control in translating processes whereby ideas and practices must be contextualized and reformulated for local contexts (Sahlin-Andersson, 1996, p.82). These rules both enable and constrain actions and practices by governing acceptable expression in terms of format, context and logic (Sahlin-Andersson, 1996: 82-88; Sahlin & Wedlin, 2008, p. 224-227).

Various, but similar, sets of rules have been set forth historically by scholars of translation. For example, Rovik (2016) postulated the four rules of copying, addition, deletion and alteration. Copying involves little or no changes from the original idea, whereas addition and deletion involve the inclusion of additional information not originally present and leaving out some

aspects for explanatory clarity. Rovik's notion of alteration allows a large degree of freedom in interpretation and modification, and, in some regards, indicates a total transformation of an idea into a new context. These insights shed light on the more rule-bound nature of translation of ideas as they spread, but remain limited to considerations of processes within organizations, rather than those occurring between organizations.

In contrast, Sahlin-Andersson (1996) points to 'editors' who mediate the translation of ideas between contexts and who are guided by implicit rules of editing. Sahlin and Wedlin (2008; 2017) proposed three primary editing rules: context rules, logic rules and formulation rules. Firstly, context rules entail the ways in which a novel idea or practice is generalized in such a way as to fit within a local setting or context. The rules of context are those that guide the introduction of a novel ideal or practice by abstraction and generalization in order to fit into a particular localized setting and increase availability for others to imitate or adopt (Czarniawska & Sevón, 1996; Sahlin-Andersson, 1990; Rovik, 1998; Greenwood et al., 2002). This set of rules encompass the transposing of one discursive or institutional language into another, and entail the extraction of the original context and its special and time-bound features (Sahlin-Andersson, 1990; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). For instance, during the introduction of the minivan, communications emphasized its basic utility as a family car by incorporating many design features of the family sedan and station wagon (Rosa et al., 1999); and, Edison, when introducing electric lighting, emphasized its similar form and utility to that of the incumbent technology, as well as adopting a similar distribution channel, and a name that suggested contiguity with the existing gas lighting category (Hargadon & Douglas, 2001).

Secondly, logic rules have been typified as involving rationales of causality or problem-solving and alter the way in which ideas are presented (Sahlin-Andersson, 1996; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). Under these rules, the realization of solutions to issues within a particular context arise, and generate motivated plans, models and efforts toward execution of these solutions that are more easily circulated (Sahlin & Wedlin, 2008; Sahlin-Andersson, 2001; Hwang, 2003). For instance, Greenwood, Suddaby and Hinings (2002) demonstrate how Canadian accounting professionals influenced structural and practice changes amongst accounting firms, expanding their service provision by integrating multidisciplinary ideals. These professionals did so by articulating problems with existing practices that lacked comprehensiveness and justifying the viability and necessity of new multidisciplinary practices. Similarly, Edison proposed that his alternative electric lighting system, while providing similar lighting benefits and distribution channels for consumers, would also alleviate problems with safety, cleanliness and cost associated with the existing gas lighting system that was in place at the time (Hargadon & Douglas, 2001).

Third, formulation rules govern the labeling of ideas and practices, as well as the construction of metaphors and stories around them (Sahlin & Wedlin, 1996; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). This configuration of rules encapsulates various narratives (Sahlin & Wedlin, 2008) that, in effect, re-label ideas (Sahlin-Andersson, 1996; Sahlin & Wedlin, 2008) for localized consumption. For example, Benner and Tripsas (2012) found that choosing a label for an idea that provides a clear metaphor can influence the potential for that idea to be legitimated. In their study on the emergence of digital cameras during the late 1990s and early 2000s, the authors found that ideas took many forms based on the background and experiences of

competing producers: photography companies used references to analog cameras; consumer electronic companies used references to video systems components, and computer companies used references to PC peripherals. Yet, the photography companies, in deploying product functionality in order to construct the metaphorical label, “digital camera,” were able to legitimate their idea, whereas others were not. This occurred, in part, because the metaphorical label, drawing from product functionality, resonated with how consumers would use the device and the label was grounded in a familiar, similar category of analog camera. Formulation rules are likewise evident in the case of Thomas Edison, who deployed functionality when renaming his company Edison Illumination Company (changing it from Edison Electric Light) to signal contiguity with the existing, gas-powered lighting companies (Hargadon & Douglas, 2001).

Metaphor, as a literary device that facilitates formulation of concepts and translation of ideas, communicates across different domains to make the unfamiliar familiar, enabling the understanding of one thing in terms of another (Cornelissen, Oswick, Christensen, & Phillips, 2008; Lakoff & Johnson, 2003). Cornelissen (2005:755) notes that “metaphor invites us to see similarities and differences between two concepts, and to see the one concept in terms of the other, making its meaning inherently more profound and exotic than a rendering of the pre-existing similarities between the conjoined concepts might suggest.” Metaphors can provide a basis for social identity (Vaara, Tienari, & Säntti, 2003) and make the novelty of an innovation more comprehensible (Cornelissen, Holt, & Zundel, 2011), legitimate, or “real” (Kennedy, 2008) by relating it to institutionalized understandings and conventions. For instance, Navis and Glynn (2010) found that the innovation of satellite radio was made understandable and formulated through metaphors linking it to better-understood technologies, products, and categories, e.g.,

“satellite radio would ‘... bring to radio what cable networks have brought to television’ (Sirius release, 6/15/99)” (Navis & Glynn, 2010: 652).

Metaphor requires an imaginative leap; it builds on the human proclivity to understand reality within a system of analogy (Barthes, 1977), which can be effective in breaking down a complex, hard-to-understand entity into more understandable bits. Gareth Morgan (1986) applied metaphorical framing to an organization by comparing it to a machine, an organism, a brain, a psychic prison, and an instrument of domination, among others. An organization is literally none of these; however, the metaphoric comparison draws attention to the similarity or likeness that aspects of organizations bear to these other entities. In all, metaphors communicate meaning by highlighting relatedness or similarity in formulating complex ideas as more readily understood and comprehensible. As such, they allow for mapping between different domains, or knowledge sets, that can lead to learning and the construction of novel mental models and modes of thinking (Cornelissen, 2005; Woodside & Amiri, 2016). The translation of ideas from one context into another can be facilitated by formulation rules that discursively attach particular meanings and understandings via use of locally resonant labels and metaphors.

The ways in which these translation rules of context, logic and formulation are enacted are contextually bound, and thus are utilized in a situationally dependent manner. The actors who engage in translation efforts, translators, or editors, are seen as embedded within the ‘flows and fashion of this culture’ (Meyer 1996: 243), and mediate or carry outside knowledge and practices into a new context (Sahlin-Anderson & Engwall, 2002). They are ‘constructed, and act in light of socially constructed and defined identities, which are understood to be made up of cultural

ideas...[t]heir purposes, technologies and resources are social constructions and change with changing ideologies and models' (Meyer, 1996, p. 243). To provide legitimated accounts of novel practices and ideas, actors must attend to the constructed nature of meaning between historical and social contexts, and the rules upon which appropriate action is necessitated (Piekkari et al., 2019; Eriksson-Zetterquist 2009, Sahlin and Eriksson-Zetterquist, 2016).

Although the 'chains of interaction' created via acts of dis-embedding and re-embedding between institutional and local contexts are rule-bound, they also give rise to creative and unpredictable interpretations as they flow. Some scholars point to the more regular, patterned characteristics of translation processes and outcomes (e.g., Kirkpatrick et al., 2013; Morris and Lancaster, 2006; Sahlin-Andersson, 1996; Wæraas and Sataøen, 2014). However, translation theorists agree that there is a uniquely creative and unpredictable element of translation, and that translation is more of an open-ended and continuous process than it is an end in and of itself (Wedlin & Sahlin, 2017; Fredriksson, Olsson & Pallas, 2014; Czarniawska and Joerges, 1996), much like the idea of robust design (Hargadon & Douglas, 2001). Bakhtin (1981) lends more explicit insight into the open-ended, or the more creative and uncertain, side of communication and dialogue that perhaps allows for the ongoing and varied translation of ideas across time and space. Understanding these creative, but rule-bound, interactions, as ideas are taken from one context and adapted to another, as patterned communicative practices lends substantial insight into the dynamics of translation of ideas and practices from an originating context into a target context.

Communication

In recent years, institutional scholars have increasingly attended to communicative aspects of institutionalization (e.g. Cornelissen et al., 2015; Suddaby, 2010; Suddaby & Greenwood, 2006; Zilber, 2008). Communication has been implicated as playing a constitutive role in institutional change and maintenance, whereby communication is viewed as process that involves actors exchanging information and viewpoints while constructing common understanding (Cornelissen et al., 2015). In a similar vein, institutions have been portrayed as interpreted and reformulated via processes of translation (Boxenbaum & Strandgaard Pederson, 2009; Rovik, 2007).

Translation is subject to complex and dynamic communication processes involving agentive actors that reformulate and interpret institutions in terms of their local contexts (Greenwood et al., 2008; Zilber, 2006). As proponents of translation theory have maintained, it is not necessarily the idea or practice that undergoes translation, but rather their accounts (Sahlin & Wedlin, 2008; Waeraas & Nielsen, 2016; Wedlin & Sahlin, 2017). Scholars have indicated that meaning contests involved in institutional processes both influence and are influenced by various power dynamics and are rooted in the communication of various narratives. For example, Zilber (2007) found that crisis narratives reinforced the institutional order of an Israeli high-tech industry, while counter stories challenged this and demanded change. Another study by Zilber (2002; p 237) found that “by offering one official account”, powerful individuals were able to control institutional meanings at a rape crisis centre.

Previous scholarship has indicated that translation is a continuous process that is enacted as various actors put forth, perceive, mediate, contest and adapt ideas and practices as they facilitate their movement from one setting into another (Oyngarden & Mikkelsen, 2020). While not linear, translation is often described in terms of its phases (Rovik, 2008; Czarniawska & Joerges, 1996;

Lindberg & Erlingsdottir, 2005; Nicolini, 2010). For example, Czarniawska and Joerges (1996) describe the how ideas are initially decontextualized from one setting and are translated into objects, or quasiobjects, which come to be defined by particular actions, and if supported, can become institutionalized over time. In other words, ideas, once abstracted, or made abstract, can be materialized into images, writing or objects, which can then travel across contexts (Czarniawska & Sevón, 1996; Kindmark & Thunberg, 2018). Throughout this movement, both idea bearers (Czarniawska & Joerges, 1996), or translators (Rovik, 2008), and the receivers of ideas are important actors in determining the longevity and eminence of the ideas that are translated into local contexts (Nordell, 2013; Latour, 1986; Rovik, 2008).

According to translation theorists, ideas are not strictly bound to the settings and environments from which they emerge, and in a performative practice (Fredriksson & Pallas, 2017), editors must attend to the rationalizations and logic of new contexts where those ideas are constructed as relevant (Sahlin-Andersson, 1996). Thus carriers, editors, or translators are required to navigate localized perceptions of legitimate reasoning and value systems in order to effectively introduce ideas into novel contexts. In this way, ideas and their reformulation by translators undergo changes in form, content and meaning as they are made relevant within new settings and contexts with localized preferences and systems of beliefs (Fredriksson & Pallas, 2017; Levay & Wacks, 2009; Rovik, 2016). In essence, it is the job of carriers, or translators, to tailor, or communicate, ideas and templates to these local contexts so that their relevance can be easily perceived, which entails imbuing these ideas with new attributes, characteristics and meaning that are recognizable and perceived as legitimate within localized settings (Fredriksson & Pallas, 2017; Sahlin & Engwall, 2002).

Many researches have highlighted the communicative nature of translation, viewing translation as a meaning construction process that creates common understandings among various groups of actors (Alkrich, Callon & Latour, 2002; Creed & Scully, 2002; Czarniawska, 2002; McCormack et al., 2001; Hardy & Maguire, 2010; Waldorf, 2013), which are materialized into local actions, artifacts and routines (e.g., Sahlin & Wedlin, 2008; Czarniawska & Joerges, 1996; Orlikowski & Barley, 2001). Through ongoing alterations of meanings, understandings and rules about the use of language within discursive spaces, certain narratives elements are reproduced, persist and remain alive, while others become dormant and fail to survive (Hardy & Maguire, 2010). In a process of co-construction between actors, meaning is mobilized when ideas move from one context into another as they are imbued with alternate connotations that facilitate localized rationales and interpretations (Waldorff, 2013; Thornton et al., 2012; Czarniawska & Joerges, 1996). This movement between one context into another as both verbal accounts and practices are transformed (Boxenbaum, 2006; Morris & Lancaster, 2006) entails persuasion and alignment of interpretation of goals in an effort to frame common meaning and identities that motivate particular collective actions (Creed, Scully & Austin, 2002). The uncertainty and multiplicity of interaction possibilities leads to unpredictable alterations in meaning as ideas are translated and actors infuse concepts with different meanings (e.g. Alkirch et al., 2002; Waldorff, 2002). Communication of narratives has been highlighted in translation literature as playing an important role in connecting cause and effect relationships between ideas, and providing descriptions of problems and proposing solutions to those problems (Czarniawska & Joerges, 1996; Höllerer, Walgenbach & Drori, 2017; Zilber, 2006).

Previous scholars have attended to linguistic and discursive artefacts such as labels, metaphors, proverbs, platitudes and rational myths in institutional processes like translation (e.g., Christensen & Cornelissen, 2005; Czanrniawska & Joerges, 1988; Outila et al., 2021; Zilber, 2006). However, it has also been noted that while sometimes such artefacts can be successfully employed and adapted to a particular situation for various control purposes, they can also be rejected, misunderstood or cause irritation rather than facilitating such institutional processes of change (Czanrniawska & Joerges, 1988). I argue that while much is known about the role of linguistic and discursive artifacts involved in institutional processes like translation, much less is known about how they operate in conjunction with other elements of communication in order to facilitate or hinder such processes.

Thus, I integrate methods and theorizing from communication studies literature in order to more deeply explore the patterned communication elements and practices underlying translation processes. For the purposes of this study, I use the term communication in a broad sense, and “mean social interaction that builds on speech, gestures, texts, discourses, and other means [...] that encompasses a range of disciplines, theories and methodological approaches” (Cornelissen, Durand, Fiss, Lammers & Vaara, 2015, p. 11). As such, speech and communication move beyond the realm of symbolic interaction into the construction of institutional reality, and lend insight into processes of institutional change and outcomes (Francesco & Colombetti; 2007; Fredriksson & Pallas, 2014; Cornelissen et al., 2015; Heritage, 2004; Searle, 1995).

Communication theories and methods, particularly those of dialogic and speech code scholars, can shed light upon the dual nature of translation as creative, uncertain and unpredictable on the

one hand (Latour, 1986; Sahlin & Wedlin, 2008; Tracey, Dalpiaz & Phillips, 2018), and, on the other, displaying regularity and rule-boundedness (Røvik, 2016; 2007; Wæraas & Sataøen, 2014) that stems from the dis-embedding and re-embedding activities involved in translation. Many communications scholars have established that multiple communication codes or variants can exist within any context, enabling actors to contest and construct meaning via interaction with one another. (e.g., Bakhtin, 1981; Bernstein, 1973; Orbe, 1998; Searle, 1965). For example, Bakhtin (1981) proposes that language is stratified into various genres and jargons, and individuals actively use and orient themselves in response to them. Similarly, Orbe (1998) contends that multiple cultures co-exist within a given society, and can strategically utilize forms of communication to achieve various ends. Variations in communication arise from the appropriation of various forms of speech codes, and can lead to differential orders of meaning (Bernstein, 1970) that become contested between more or less dominant social groups (Halliday, 1976; 1978). Thus, it is important to understand how different social groups and actors communicate ideas in terms of what is already locally normatively accepted as valued and valid in an effort to translate them into local field level practice change.

According to Jakobson (1960), language is interactional in nature, and any speech event is composed of an addresser, addressee, message, context, code and contact, wherein “the addresser sends a message to the addressee. To be operative, the message requires a context referred to . . . seizable by the addressee, and either verbal or capable of being verbalized; a code fully, or at least partially, common to the addresser and addressee . . . and, finally, a contact, a physical channel and psychological connection between the addresser and the addressee, enabling both of them to enter and stay in communication.” (Jakobson, 1960, p. 353). This is further extended

upon by Hymes (1964) in his ethnographies of communication, which asserts that communication and discourse must be understood in light of the contexts in which they are used. The broader meanings and patterns of communicative interactions are deeply embedded within social systems, whereby “aspects of meaning and interpretation are determined by culture-specific activities and practices . . . [which] are interconnected in turn with the larger sociopolitical systems that govern and are in part constituted by them” (Gumperz & Levinson, 1991, p. 614). In addition, language is not only embedded within social and cultural systems, but these systems are, in turn, embedded in their communication, as they are reified and manifested through language that provides particular meanings to various actions and thoughts, and “typifies these meanings through creating ‘semantic fields or zones of meaning’ within which daily routines proceed” (Heracleous & Marshak, 2004, p. 1290).

In order to communicate institutional facts and knowledge, language is necessitated (Searle, 1995) and allows for the construction of cognitive frames that highlight some meanings and interpretations of social relations and practices, while excluding others (Bateson, 1972; Phillips & Brown, 1993; Fairclough, 2003). “Discursive construction takes place through social interaction; in the organizational context it occurs when managers ‘author’ their experiences in the process of interacting with others, simultaneously constructing a shared sense of their identities, their organization, and of appropriate ways to talk and act (Cunliffe, 2001). Language, in this perspective, does not simply mirror social reality but constitutes it, creating conditioned rationalities as widespread ways of thinking within particular social systems (Gergen & Thatchenkery, 1996; Heracleous & Marshak, 2004).

Translation, through communicative activity, increases the acceptance and applicability of ideas and practices across fields, allowing for theorization and abstraction of these practices or ideas beyond any one context (Ocasio et al., 2015). Translation theory emphasizes local variation as knowledge and ideas from one context travel and are implemented within another (Latour, 1986; Wæraas & Sataøen, 2014). As these ideas travel, they must be translated into locally resonant vernaculars (Malets & Zajak, 2014) in order to allow for various interpretations of multiple social groups with different constructions of meaning, who interact to mediate the spread of ideas and practices. However, to date, there has been little research that explicitly explores the actual patterns of communication underlying the translation of ideas from one setting into another. Thus, in the next section, I engage the scholarship and methodologies of communication theory (Hymes 1962, 1972, 1977) and speech code theory (Philipsen, 1997) in order to improve our understanding about the role of communication in translation processes.

Elements of Communication

Communication theory that takes an anthropological, rather than merely linguistic, stance to understanding language use as based upon sociocultural practices and beliefs (Hymes, 1962; 1974), which later evolved into speech code theory (Philipsen, 1997), reveals descriptive, explanatory and predictive power to understanding patterns of communication that facilitate translation processes. Speech code theory (Philipsen, 1997; Philipsen, Coutu & Covarrubias, 2005) helps to explain relationships between communication and culture by attending to the distinct psychologies, sociologies and rhetoric of the multiple speech codes that exist within all cultures (Philipsen, 1997; Philipsen & Hart, 2015). Speech codes are defined by a “historically enacted, socially constructed system of terms, meanings, premises and rules pertaining to

communicative conduct” (Philipsen, 1992: 56), and refer to various rules, or coding principles, “governing what to say and how to say it in a particular context” (Bernstein, 1972; Miller, 2004).

Speech codes, highly resonant with the editing rules of translation, offer an established and systematic consideration of the contexts under which particular ways of communicating are meaningfully employed within and between distinct social groups. Speech codes are socially and historically constructed systems of language, meanings, beliefs, and rules that frame and govern communication conduct (Bernstein, 1971; Griffin, 2008; Philipsen, 1997). According to Bernstein (1971), variations in communication arise from the appropriation of elaborated and restricted codes, and are determined by different types of social formation. Elaborated codes are those forms of speech that are more changeable, and less contingent upon a particular structure, while restricted codes are less changeable and more contingent upon a given social structure.

Bernstein (1971) contends that in contextual situations where members have a high degree of identification, communication takes on a specific form, based on the shared interests and understandings of the group. In such situations, roles are clearly defined, and a strong bond exists between members. This type of social formation elicits the use of elaborated codes, orienting users toward more universalistic meanings that can be understood from a shared background that need not be explicitly stated. Alternately, in situations where social positioning of members is more ambiguous, members must engage in negotiation of roles and meanings. In this way, linguistic and communication patterns demarcate the boundaries of membership and non-membership within a particular social group or community, protecting these identity boundaries via distinction and maintaining social distance from other groups. Speakers must explicate their

positions and clearly define their viewpoints by making use of more restricted codes that orient users to more particularistic orders of meaning. Hymes (1974) extended speech code theory to incorporate a contextualized approach to interpreting and understanding communication acts in relation to one another. He, and others, contended that codes are enacted in fairly predictable and patterned ways within a specific context.

The works of Bernstein (1971) and Philipsen (1997) highlight the role of speech codes, or rules “governing what to say and how to say it in a particular context” (Bernstein, 1972) whereby “within the same society, there can exist different social classes whose communicative practices differ in important ways” (Philipsen, 1997). Hymes (1962, 1964, 1972, 1974, 1986). elaborated further upon the contextual use of language, emphasizing local speech communities and ways of communicating within and amongst particular cultural and social contexts. By integrating the fields of ethnography and anthropology, Hymes developed the concept of the ethnography of communication, attending to the contexts in which social groups communicate and interact as they make sense of ideas and practices (Keating, 2001; Grumperz & Hymes, 1986; Hymes 1962, 1964, 1972, 1974, 1986). Speech communities, akin to communities of practice (e.g., Lave & Wenger, 1991), consist of patterns of community member communications, and membership requires knowledge of both the community itself and what is appropriate to say, as well as how and when to say it. Examples of various speech communities could be school boards, professional groups, or even online discussion groups; these various parties have distinct ways of communicating, terminology, and ways of understanding ideas that are patterned and implicitly understood by their members.

Nested within speech communities are three levels: the speech situation, speech event and speech act (Hymes, 1974). A speech situation occurs within a speech community as a series of social interactions and communicative acts. For example, a conference on addiction and mental health represents a particular speech situation in which various professional groups, or speech communities may interact. These interactions, or speech events, are particular instances of speech exchanges and could come in the form of slide show presentations, lectures, or discussion panels. Each of these speech events and interactions consists of a multitude of communicative acts, or smaller units of speech or communication, like small talk occurring during a presentation, the keynote speaker offering an introductory message, the timekeeper signaling that there are five minutes left, or people asking questions during a question and answer period. Each of the communicative acts that compose the speech event are interpreted in culturally specific ways, and while they individually may not indicate communicative significance, they collectively combine as a sequenced and structured set of community practices within speech events that facilitates meaning construction and comparison across speech situations (Keating, 2001; Sherry, 1988; Kalou & Sadler-Smith, 2015).

Speech, or communication (Hymes, 1974) acts are seen to constitute a performative role in institutionalization, whereby linguistic utterances transfer and construct discursive reality and objects between participants (Cornelissen et al., 2015; Searle, 1969; Quinn & Dutton, 2005; Sweetser, 1990). “Speech acts are metaphorically treated as exchange or transfer of objects from one interlocutor to the other; the objects are linguistic forms, which are containers for meaning. This object-exchange metaphor for speech exchange has been analyzed under the name of the ‘conduit metaphor’ (Reddy, 1979)” (Sweetser, 1990: 20). In this way, language acts as a force of

institutional process like translation across institutional fields, influencing the ways in which various actors and speech communities interact, constraining and enabling their activities and thoughts, and shaping the manner in which institutions emerge, and are reflected, maintained or changed (Cornelissen et al., 2015).

In the interest of enabling deep analysis of the ways in which speech community members engage in communication within local contexts, Hymes (1974) developed a convenient and adaptable grid that he dubbed the SPEAKING model as an acronym for elements of communication acts. This tool allows researchers to unveil and model patterns of communication based on characteristics, or elements, of situated communicative activity. The elements of *SPEAKING* pertain to communicative characteristics: the *setting*; *participants* involved; intended *ends*, or goals of communication; the *act sequence*, or order in which information is presented; the *key*, or tone of language used; *instruments*, or manner of communicating, including the discursive ways in which meaning is conveyed; the *norms* surrounding the type of communication within a given context; and the *genre*, or type of communication. The SPEAKING grid provides an analytic means by which to rigorously and systematically evaluate the patterns of communication involved within particular contexts, while attending to the culturally and socially situated aspects of language use within these contexts. According to Hymes (1962; 1974), depending on the research question and context being studied, one can choose to omit, include, or adapt any of the elements in order to best explain the phenomena of inquiry. The SPEAKING grid will be described in more detail in the next chapter, but generally, it provides a framework from which to systematically analyze the ways of communicating that constitute translation processes; it offers a general formula from which to systematically observe,

analyze and describe the patterns of various communicative elements that compose various speech situations, or policy documents, and the patterns of communication practices amongst speech community members, government ministries, as they employ the editing rules of translation.

To reiterate, for the purposes of this study, I was concerned with not only the communication patterns underlying the travel of ideas, but also elucidation of how ideas are recontextualized as they circulate. Thus, I incorporated the characteristics of the editing rules of context, logic and formulation (Sahlin & Wedlin 2008; Sahlin-Andersson, 1996; Wedlin & Sahlin, 2017) into the SPEAKING grid, under the element of instruments. These rules governing the translation process are somewhat restricted in that they are typically observed in hindsight, after they have been enacted during translation processes. Previous scholarship has emphasized that editing rules, rather than being explicit sets of “rules to follow” for translators, are found in retrospective studies as “rules which have been followed” (Sahlin-Andersson, 1996: 85). Such tools include the use of rationales and discursive devices that facilitate the travel of ideas between contexts (Chua, 1995; Mennicken, 2008; Özen & Berkman, 2007; Sahlin & Wedlin 2008, Sahlin-Anderson, 2009; Wedlin & Sahlin, 2017), but do not account for other communicative characteristics involving translation, such as setting, participants, ends or genre.

Combining translation and communication theories and methodologies facilitates a deeply descriptive and contextual explanation of the communicative processes and patterns by which chains of imitation flow, and allows for creative, but rule-bound and patterned, local variations in adaptation and implementation. By accounting for the multiplicity of meanings and contextual

nature of interaction, like theories of speech codes do, the inner circuitry of translation can be more thoroughly explicated. The success of translating knowledge and ideas to discursively persuade audiences of their relevance and applicability depends on how they are communicated.

Communication processes are inherent within the editing rules of translation; positing similarities between ideas and their local context and decoupling extraneous characteristics of the originating context, constructing legitimate rationales, and formulating particular labels, metaphors and narratives all rely upon effective communication tactics that resonate with local audiences. Communication theories, like speech code theory and methods, allow for the systematic explication of the dynamics of translation activities as they unfold over time, via the patterns of communication practices of those aiming to transpose and adapt ideas from one context into another. While much literature has focused on the end results of translation and implicitly considers communication dynamics, I explicitly examine the role of communication during the translation of novel scientific research findings into policy, providing important insights into understanding the how of translation and the rules that facilitate the dynamic and variable travel of ideas from one context to another.

In this chapter, I have outlined the metaphors used to describe translation processes, and discussed the editing rules involved with the dis-embedding and re-embedding aspects of the travel of ideas. Further, I delved into communication scholarship in order to better understand translation as an inherently communicative process. In particular, I discussed speech codes theory and methods of ethnography of communication, which I use to systematically explore the dynamics of translation activities as they occur over time. In the next chapter, I will expound

upon these methods in more detail, and explain how I used them to understand the role of communication during the translation of science research into policy.

CHAPTER III: METHODOLOGY AND RESEARCH DESIGN

Research Question

The research question guiding this study is: What is the role of communication in the translation of novel scientific research findings into policy? Extant research has been devoted to understanding the outcomes of translation, but less research has explicitly focused upon the communicative mechanisms facilitating the process. Past studies have often implicitly assumed that communication underpins translation activities, but have rarely specifically attended to the intricacies of its role, particularly in terms of how concepts change over time. Combining insights from communication and translation theorists provides a foundation for improving our understanding of how research findings can be translated into policy.

Research Setting

This study focuses on the context of addiction and mental health services in Alberta, Canada. Historically in Canada, there was little emphasis placed upon treatment of addiction and mental health. A moralistic approach prevailed that primarily advocated treatment in prisons and asylums dominated until the 1940s (MHAPP, 2004). During the 1960s, the development of the Alcoholics Anonymous 12 step recovery program spawned efforts to establish government funded education, treatment, and support services for alcoholism. Later, toward the development of a disease model, community services and supports were designed with a goal of reintegration, rather than confinement, of affected patients into society.

Throughout the 1970s and 1980s, new knowledge from biological psychiatry postulated the existence of certain neurotransmitters in the brain that could be linked to particular mental illnesses. The invention and wide-spread adoption by the 1990s of the positron emission

tomography (PET) scanner for medical diagnosis of brain diseases and research involving mapping the human brain marked a significant period of enhanced knowledge advancement about the nature and structure of the brain. In 1992, Canada's first PET centre opened to research mental illnesses. During the next several years, Canadian scientists developed a series of radioactive tracing agents that are commonly used worldwide in human neuroscience research. Since then, an emphasis on empirical research has led to significant advancements within the field of mental health and addiction, and has effectuated noteworthy changes in policies on a field level.

Mental health and addiction services in Alberta, Canada aim to achieve collaboration between advocacy, policy and stakeholder interests in order to facilitate both research and service advancement (AMHSCN, 2014). Further, collaboration between multiple interprovincial, national and international partners is held of importance. Recently, funding partnerships have been developed in order to build "capacity for applied, practice-driven addiction and mental health research across Alberta" (AMHSCN, 2014). In 2005, the development of the Research Partnership Committee (RPC) spawned the construction of collaborative strategies that emerged from members of industry, government, funding providers, consumers, service delivery and academics. Addiction and mental health services in Alberta are directly influenced by Alberta Government Ministries that promote and effectuate programs for awareness, prevention and treatment for mental illness and substance problems. Awareness programs typically involve the provision of current and accurate information. Prevention programs adopt a population approach to increasing protective factors and decreasing risk factors, with more targeted programs for particular groups. These programs recognize and attempt to include multiple stakeholders such

as the community, parents, workplaces and schools. Lastly, treatment routines involve specialized programs for targeted groups including Aboriginal peoples, business and industry, women and youth to help to improve mental health and develop life skills that aid recovery processes.

In all, the field of addiction and mental health in Alberta is an ideal context from which to study translation processes, especially given the active and strategic efforts expended toward ‘bridging the gap’ between research, policy and practice (e.g., Karen Golden-Biddle et al., 2003).

Additionally, this setting is particularly a particularly relevant one from which to understand the communication processes underlying translation, as there have been marked attempts to communicate science-based understandings of addiction and mental health amongst Albertan populations in an effort to guide evidence-informed decision-making practices within the field.

Research Design

In attempting to understand how research can be translated into policy, I adopted a social constructivist stance (Berger & Luckmann, 1967) as I attended to the many different languages (Callon & Latour, 1981), perspectives and meanings of various interacting social groups as they evolve over time (Smircich & Subbart, 1985). From this viewpoint, rather than existing externally and independently from individuals, knowledge and meaning are understood to be linguistically co-constructed between people as they interact within specific institutional, cultural and historical contexts (Creswell & Poth, 2016; Parker, 2004; Yilmaz, 2013). Social constructivism recognizes the multiplicity of meanings and realities (Berger & Luckmann, 1991) that inform knowledge construction and transfer while also asserting that individual beliefs and values influence the actions they undertake (Creswell, 2013). In the words of Parker (1998: 19)

“...even if there were some ultimate or fixed reality behind discourse..., we could never describe it, since to do so would inevitably mean to offer an account of it, thus transforming it into a discursive event.” Thus, a social constructivist approach is a suitable one because it emphasizes the co-creation of meaning and reality as various actors interact and communicate in order to inform beliefs and values, and ultimately, action, including the translation of novel scientific knowledge into policy. In analyzing the communicative texts occurring between various actors in a field, we can more deeply understand the events and actions that constitute such complex phenomena as translation.

Data sources included all publicly available policy documents and archival reports surrounding the translation of research stemming from neuro and brain sciences into the field of addiction and mental health occurring between 1990 and the present. The research process and design involved purposive and systematic data collection and analysis stages. The results of this project provide an in-depth explanation of communication processes involved in the spread of novel scientific research findings into policy. In this and the next sections, the methodology of this study is detailed, beginning with the research setting, then describing the research design, data sources and collection, and concluding with the systematic analytical framework and procedures used for each of the policy documents comprising the dataset.

Multiple Case Analysis

This embedded multiple case study (Yin, 1994; 2012; 2015) explores three similar situations of translation of research findings into policy. Such designs are preferable to single case designs because they are often more compelling and robust (Yin, 1994), and because they allow for richer, more reliable models (Yin, 2015), particularly if the cases provide similar results and can

substantiate theoretical development of the phenomena (Eisenhardt, 1989; Gustafsson, 2017). Further, inclusion of multiple cases within the same study facilitates cross-case analysis. In this way, I was able to understand similarities and differences between the cases (Baxter & Jack, 2008; Stake, 2005; 2013), and thereby conduct data analysis both within and across cases (Yin, 2003). This design allows for more in-depth exploration and theory advancement compared to single-case ones (Eisenhardt & Graebner, 2007). The primary rationale for selection of each of the cases was due to their potential relevance for policy, as well as the similarity of the research findings in that they were all scientifically grounded and widely recognized as sound research. Each of these cases initially appeared to be similar, and based on established translation theory could be expected to undergo similar translation processes; there were no reasons why one case would be translated more or less easily, or more or less quickly or effectively than the others.

Identification of Cases Based on Prominent Research Findings

To arrive at the three cases comprising this multiple case study and to familiarize myself with the history and context of the field, I first began by conducting a broad search of documents, finding and reading all data relevant to the neuroscience of addiction and mental health in Canada (Please see TABLE 1: SEARCH TERMS FOR NEUROSCIENCE OF ADDICTION AND MENTAL HEALTH). In particular, I focused on government documents produced beginning in 1990, marking the beginning of the “decade of the brain” and rapid development in neuroimaging techniques, onward. The focus upon government documents was strategic, as these documents represent an official, formal and publicly available set of data surrounding addiction and mental health activities. Using a core set of documents, including the “Kirby Report” on Mental Health, Mental Illness and Addiction from Canada’s Standing Senate Committee on Social Affairs, Science and Technology (2004), I engaged in an iterative, snowball sampling

technique to familiarize myself with the topic of mental health and addiction in Canada. From this, I was able to broadly familiarize myself with the context of addiction and mental health in Canada (Please see TABLE 2: TIMELINE OF IMPORTANT EVENTS INFORMING ADDICTION AND MENTAL HEALTH IN ALBERTA). Additionally, to enhance my understanding of past and ongoing scientific research occurring within the field, I collected science journal publications frequently cited within the documents. From this initial broad set of texts and scientific literature, I could then systematically identify three prominent research findings, described below, within the field over time since major developments in brain and neuro and brain sciences, particularly with the advancement of brain imaging techniques. These three research findings provided the foundations for data collection, which was based upon the three cases, Adverse Childhood Experiences, Origins of Addiction, and Concurrent Disorders. (Please see TABLE 3: CASES AND RELEVANT RESEARCH).

Case 1: ACEs

The first case I chose to analyze is that of *adverse childhood experiences (ACEs)*, which have been identified in research as significant events that provide the foundations for later mental health and addiction issues. The Adverse Childhood Experience Study (Felitti et al., 1998), showed that adverse experiences, such as trauma, abuse and chronic stress during childhood, have major impacts upon the developing brain and lifelong human trajectory. In essence, the findings of this research revealed that early negative experiences, such as loss of a parent or physical abuse, affect a child's brain development and increase the risk of substance abuse and mental illness. In associated research studies, this correlation was substantiated and provided further insights into the relationships between the neurobiology of childhood trauma and later life trajectories. The original ACEs study from Felitti et al. (1998) found significant associations between ACEs and lifelong physical and mental health outcomes, such as morbidity, substance

abuse and depression. Researchers have demonstrated that adverse experiences during childhood can lead to maladaptive changes in the neural networks and neuroendocrine systems of the brain, which have long term consequences for the developing brain, and later mental and physical health. Felitti et al. (1998) spawned a plethora of subsequent scientific research articles and conferences aiming to further understand the role of early experiences, brain development and lifelong health trajectories. This particular research has had profound implications for practice and policy; decision-makers have since implemented several measures to mitigate the impact of negative early experiences via various prevention and intervention strategies before they manifest in later development of addiction and mental health issues.

Case 2: Origins of Addiction

The second case I chose to analyze is research determining the definition and *origins of addiction*. Articles and studies published by researchers such as Koob et al. (1998) demonstrated the neural basis of addiction, and identified specific regions of the brain, like the nucleus accumbens and amygdala, as well as neurotransmitters, like dopamine, that underlie the arousal of neural reward and motivation systems associated with drug use. Koob is a highly regarded researcher of the neurobiology of addiction disorders, and has published a multitude of research findings regarding the neurocircuitry and brain regions associated with addiction. In 1998, he and his colleagues published a much-cited review of this research, highlighting relationships between addiction and neurobiological processes, brain structures and neurotransmitters (Koob, Sanna & Bloom, 1998). Specifically, this research article suggested that brain reward circuitry underlies many characteristics of all forms of addiction, including predisposition, vulnerability and relapse. This article, along with the brain science research findings that it reviews, helped to lay the foundation for understanding addiction as a chronic disease of the brain. This novel knowledge from brain science holds implications for policymakers and for healthcare

professionals in terms of intervention, prevention, treatment and criminal justice strategies, and has influenced and changed the ways in which these decision-makers approach and deal with people who suffer from addiction. For example, several policy and practice changes related to this research have since been implemented, such as trauma-informed approaches to addiction and other evidence-based practices around mental health and addiction, that acknowledge the effects of stress and trauma on the brain, and the regions and neuropathways associated with risk and reward, and subsequent substance abuse issues.

Case 3: Concurrent Disorders

The third case that I identified for analysis is the research regarding *concurrent disorders*, which consists of research findings establishing the common neuropathways and brain structures involved in addiction and mental health disorders. For example, research findings from studies from researchers like Markou, Kosten & Koob (1998) detail the common etiology of both addiction and mental disorders, and suggest that similar brain and neural structures underlie mental health issues, like schizophrenia, depression and PTSD, and addiction disorders. Such research that demonstrates these common neural underpinnings explains the high prevalence rates of patients presenting both mental health and substance abuse disorders, and has had important potential ramifications for policymakers.

Understanding the underlying epidemiology of these concurrent disorders and their shared neurobiological roots has the potential to improve the development of better and more appropriate policy governing treatments and interventions for those affected by such disorders. Historically, addiction and mental health disorders have been considered separate issues, and have been treated as such; by integrating service provision that recognizes the similar epidemiology underlying both disorders, health care policy could mandate that providers offer

more targeted, cost-effective and appropriate services to such patients. The implications of this research are evidenced, for example, in attempts at restructuring of the health care system in Alberta to integrate addiction and mental health services and break down their historically siloed approaches amongst practitioners and decision-makers.

Data Collection

Focused Case-Based Data Collection

Because I was specifically interested in how the research findings for each of the three cases were translated into policy, I gathered all relevant policy documents published by provincial government ministries. Ministry policy publications are a fruitful way from which to examine the translation of research into a field because in Canada, ministries are responsible for governing the practices and activities falling under their domain. Further, policy documents represent formalized, official documentation surrounding various government efforts to effectively manage and govern these domains. Using online databases such as OpenGov, as well as ministry website archives, I rigorously and meticulously searched for and recorded all policy documents published by Alberta ministries that involved discussions of the three prominent neuroscience research findings related to addiction and mental health (n=219). After this expansive and comprehensive search that focused on each of the cases, it became apparent that two ministries, Alberta Health and Alberta Education, were particularly active in their publication of policy documents that reflected emergent brain science and addiction and mental health research findings. (Please see TABLE 4: MINISTRIES, AIMS, SERVICES). Thus, in the interest of a deep descriptive and explanatory understanding of the role of communication in the translation of new research into policy, the policy documents from these two ministries provided the primary data for analysis in this study (n=91), and the documents from other ministries were retained for the purpose of

triangulation and confirmation of assertions. [Please see TABLE 5: DOCUMENT TYPE PERCENTAGES]

Data Analysis

After collecting all ministry policy documents related to the three cases, I systematically analyzed these documents to trace how the aforementioned research findings were communicated over time. The analytic process involved recording each reference to the research findings within the policy documents, along with the context in which it was referred to in terms of who said what to whom when, how it was said and in what format. I utilized the SPEAKING analytical tool in order to systematically code the contextual elements of these communications and to gain deeper insight into how research findings were dis-embedded and re-embedded during their translation into these documents. In this way, I was able to garner the ways in which the research findings of the three cases have been communicated within policy documents. After each of the three cases were analyzed individually, I carried out cross-case analysis in an effort to uncover patterns and variations and make assertions about the communication processes underlying translation based on the analytical evidence.

I employed speech code theory (Bernstein, 2003; Philipsen, 1997; Philipsen & Hart, 2015), and communication methods (Hymes, 1974) to understand the role of communication processes involved in the translation of novel scientific knowledge. I adapted the S.P.E.A.K.I.N.G. model of analysis (Hymes, 1974) to identify and analyze communicative elements of policy documents over time, and to reveal nuanced insights into variation across cases over time. Hymes' (1974) mnemonic SPEAKING tool can be fruitfully employed to analyze any communication practice, including both verbal speech and written documents, in order to understand how people

communicate and the patterns of those communications (Hymes, 1974; Carbaugh, 2007; Zand-Vakili, Kashani & Tabandeh, 2012). Following the analysis of each case individually, I engaged in cross-case analysis in an effort to understand the similarities and differences among the cases concerning the ways that the respective research findings were communicated during their translation into policy documents.

Analytical Frameworks for Data Coding

The stages of the coding process were systematic, and were used to individually analyze each of the three cases identified above and focused upon various meanings and actions surrounding a particular idea or practice (Mayring, 2000; 2014). The case analyses were guided by the SPEAKING analytical tool and were managed and coded using NVivo software. I used the SPEAKING model to identify specific components of communication patterns in all policy documents that constituted my dataset. Because policy documents are specifically formatted to follow government communication standards, I modified the SPEAKING model with respect to the *instruments* element, as explained below. The unit of analysis was a segment of policy text relevant to my research question about how research was translated into policy; the content and size of these text segments varied, depending on whatever sections meaningfully contributed to understanding my focal research topic (e.g., Labuschagne, 2003).

Stages of Analytical Procedure

The analytical procedure for this project was carried out in two stages. [Please see FIGURE 1: OVERVIEW OF METHODS PROCESS] The first stage of analysis involved identifying and coding the selections of text that referenced the research findings for each of the three cases individually, according to the SPEAKING elements, in order to identify the core characteristics and patterns of communicative activities found in the dataset. Secondly, I conducted a cross-case

analysis, which entailed linking the previous stages of analysis together to theorize more broadly about the role of communication in translation processes by comparing and contrasting the three separate cases with each other. In this section, I begin by briefly defining the elements of the SPEAKING model, provide an operational definition for each of the editing rules of translation, and then describe in detail the stages of the analytical procedure involved in this project.

Data Analysis Stage One: SPEAKING Model

Hymes (1974) contended that communication practices are governed by rule-like behaviour, and that the job of the researcher is to infer these rules from systematic analysis of communication. Each document was broken into the elements of an adapted version of Hymes's (1974) SPEAKING model to initially structure the coding process and to uncover patterned qualities, or elements, of specific communication practices involved in policy. The elements contained within the SPEAKING model are setting, participants, ends, act sequence, key, instruments and genre. As explained in detail below, not every element was useful in relation to the research question, or there was such little variation of some elements within the documents that their inclusion did not meaningfully contribute to analysis. Thus, these elements with little utility or variation were omitted from analysis if deemed superfluous, which, according to Hymes (1974) is considered acceptable when using this model. The elements that were useful were retained, and, for the most part, were fairly easily coded. Throughout, the codes used were clearly defined and revisited to ensure that they described the text that they were composed of (Please see TABLE 6: SPEAKING ELEMENTS OF SPEECH EVENTS).

I employed the SPEAKING tool in an effort to elucidate the patterns of communication involved in the translation of scientific research into policy. Initially, I analyzed and evaluated all elements

of the SPEAKING tool for policy documents comprising the data of this study. The elements that were most useful in addressing the research question, and that I chose to retain, from the SPEAKING grid in order to do so were: *setting*, as the years of policy publication; *participants*, in terms of authoring ministries and their intended audiences; the *ends*, or aims of each policy document; the *instruments* used to convey messages, for which I examined the various types of rationales and language used to present science research within the documents; and the *genre*, or type, of policy document under investigation. However, after testing the tool with a subset of my data, I chose to omit the SPEAKING elements of act sequence, key and norms for the purposes of this study because they added little or no explanatory value to understanding the translation of science research into policy, given that policy documents tend to be fairly similar in their formal structure and format. The lack of meaningful variation of these three elements over time is perhaps due to the unique characteristics of policy documents, as they are highly formatted prior to publication, in line with government mandated approaches to communication. Thus, the SPEAKING elements of act sequence, key and norms were not retained in order to best capture the dynamics of the communication patterns involved in the translation of science research into policy.

The *instruments* element of SPEAKING tool displays much continuity with the discursive attributes of the dis-embedding and re-embedding aspects of translation, and refers to the general linguistic tools used to convey certain messages, including the forms and styles of communication used by participants involved in communicative activities (Hymes, 1962; 1974). This element has been used to identify and categorize various ways of communicating, including different languages or dialects used by participants (e.g., Blommaert & Backus, 2013), such as

French or English. It can also be used to explore various discursive tools, like jokes, idioms and metaphors that participants use to convey meaning (Zand-Vakili, Kashani & Tabendeh, 2012; Foley, 1995; Penfield & Duru, 1988). While there is a great deal of similarity between the *instruments* element of the SPEAKING grid and the editing rules of translation, in light of the research question at hand, more detail was needed in order to adequately explore the communicative patterns underlying translation. Due to the distinctive characteristics of policy documents, in that they rarely, if ever, include multiple dialects, languages or jokes, and are formal and highly edited prior to publication, I determined that this element required adaptation in order to address the research question guiding this study.

To restate, my research focus is on examining the communicative patterns involved in translation processes occurring within a particular context and situation. Thus, I wanted to focus my attention during evaluation of the *instruments* aspect by understanding the patterned, rule-like and communicative activities that are involved with the travel of ideas, which are detailed within multiple scholarly works on translation (e.g., Chua, 1995; Mennicken, 2008; Özen & Berkman, 2007; Sahlin & Wedlin 2008, Sahlin-Anderson, 2009; Wedlin & Sahlin, 2017). I adapted this element to specifically gain insight into how the various rationales, metaphors and labels comprising the three editing rules of translation (Sahlin & Wedlin 2008; Sahlin-Andersson, 1996; Wedlin & Sahlin, 2017) are used to communicate research findings within each policy document, and to uncover patterns of use over time for each case.

The three editing rules of translation are as follows: context rules, which entail the generalization of ideas and transposition of one discursive or institutional language for another (Sahlin-

Andersson, 1990; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017); logic rules, which involve rationales of causality or problem-solving that change the ways ideas are presented (Sahlin-Andersson, 1996; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017); and formulation rules, which involve the labelling of ideas including metaphors and narratives surrounding them (Sahlin & Wedlin, 1996; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). I used these as an evaluative tool to analyze policy documents by firstly coding each of the three editing rules (context, logic and formulation) as they appeared within each policy document, and then categorizing the different discursive tools comprising each set of rules, which were then organized into various representative themes. For example, metaphors used to convey research findings were categorized under the editing rule of formulation, and sometimes made architectural references to understanding how brains are built. Such metaphors were then thematized as ‘architectural metaphors’.

Attending to the use of editing rules under the *instruments* element (described further in the next section) allowed me to clarify how they are communicatively enacted in relation to the other elements of the SPEAKING model, both within each policy document, and between documents over time as ideas travel from the realms of scientific research into policy. In short, the SPEAKING model on its own, without adaptation of the *instruments* element, would not have allowed for the depth of understanding needed to elucidate communicative patterns underlying the specific phenomenon of translation of scientific research findings into policy. While it was critical to adapt the instruments aspect of the model, the other elements of setting, participants, ends and genre, served as effective analytic tools with respect to the policy documents, and the research question.

The editing rules of translation are contiguous with the *instruments* element, as they both rely upon linguistic and discursive tools to convey ideas. Such tools include the use of rationales and discursive devices that facilitate the travel of ideas between contexts (Chua, 1995; Mennicken, 2008; Özen & Berkman, 2007; Sahlin & Wedlin 2008, Sahlin-Anderson, 2009; Wedlin & Sahlin, 2017), but do not account for other communicative characteristics involving translation, such as setting, participants, ends or genre. Therefore, I used these in order to understand and examine the SPEAKING aspect of *instruments*. This allowed me to explore and detail how editing rules were used to communicate and translate research findings within policy documents over time. For example, I was able to examine the use of logic rules involving the rationales of cause-and-effect and problem-solution, as well as formulation rules such as the use of labels, metaphors and narratives. Additionally, the SPEAKING grid facilitated rigorous and systematic examination of contextualized, situated enactment of the editing rules during policy communications by simultaneously attending to how and when certain editing rules were used to translate research findings, by whom, for what audiences and with what goals, and in which types of policy documents over time.

Sahlin (1996) posits the three general editing rules mentioned above. The first set of rules of *context* entails the removal of the spatial and time bound features of the original context, thereby increasing its abstractness and generalizability (Sahlin-Andersson, 1990). Context rules were coded when research was contextualized into a specific case, and was made relevant to audiences through generalized reconstruction of current brain and neuroscience. To illustrate, a summary of recent research findings on say, brain plasticity, would be coded as “context rules”. Second, *logic*

rules alter the presentation of an idea by clarifying cause-and-effect relationships, and employing problem-solving rationales (Sahlin-Andersson, 1996; Sahlin & Wedlin, 2008). Thus, logic rules were recorded as a code when the discussion employed rationales of causality, or when problems and solutions were proposed. Text was coded as “logic rules” if it engaged any of these types of rationalizations, for example, if the concept of brain plasticity was used to justify early childhood development interventions, or some form of treatment or activity over another. *Formulation* rules essentially alter the language around which an idea is presented through the use of various narratives and labels (Sahlin & Wedlin, 2008). This occurs via repeated circulation as ideas acquire particular categories, names and labels that enhance local capabilities to make sense of the novel idea. Formulation rules were coded with the use of stories, labels and metaphors that referred to more technical concepts and explanations. To illustrate, I coded the use of metaphors and labels, including ‘early childhood experience’ or ‘brain architecture’ when describing research findings from studies of topics like brain plasticity, as “formulation rules”.

The *instruments* typically refer to the forms and styles of communication used within particular settings, and for the purposes of this study, these were coded in terms of the editing rules of context, logic and formulation used within policy documents (Sahlin-Andersson, 1996; 2001; Sahlin & Wedlin, 2008; Wedlin & Sahlin, 2017). Editing rules refer to Sahlin-Andersson’s (1996; 2001) patterns of translation “rules that have been followed” as practices and ideas undergo movement between contexts. During the travel of ideas, while there is no set of explicit rules, there are rule-like patterns that have been observed. However, rather than being an entirely open-ended and creative process, translation relies upon effective deployment of these editing rules that both enable and constrain the process, influencing the acceptability of the ideas or

practices that are being circulated. Due to the context-bound nature of translation, different contexts will provide insight regarding different variations of these rules. Overall, investigation of the editing rules of translation have been somewhat limited due to the fact that they can be only retrospectively observed, and by their context-dependent nature. Thus, by including them within the analysis of the SPEAKING grid, I was able to advance understanding of their contextuality by accounting for their situatedness in terms of setting, participants, ends, and the genre of communication involved in their deployment within policy documents.

In all, the SPEAKING grid enabled me to systematically uncover and explain the patterns of communication about research findings as they were translated into policy documents by attending to situated and contextual elements of these communications (Please see TABLE 6: S.P.E.A.K.I.N.G ELEMENTS OF SPEECH EVENTS). By employing this method, I was able to rigorously track and explain how, and for what purpose, research was captured and conveyed in policy documents over time, by whom and for what audiences, in which types of documents for what purpose, and, importantly, how the editing rules of translation were enacted during these communications. This approach allowed me to gain new insights into the patterned communication surrounding the presentation of innovative ideas as they are translated from one context, science, into another, policy.

Data Coding Stage Two: Cross-Case Analysis

Although each of the cases, Adverse Childhood Experiences, Origins of Addiction and Concurrent Disorders, stem from related research findings from brain science and show similarities in their communication and eventual translation into policy, the first stage of analysis revealed that each had different features demarcating the underlying communication processes.

Cross-case analysis permitted the development of new understandings about the overall translation process by highlighting uniformities and variations characterizing the communication processes of translation. In what follows, I provide an explication of how cross-case analysis was conducted. As explained above, I employed the modified SPEAKING model to analyze the communication elements of policy documents and the deployment of editing rules for each case. Next, I compared and contrasted results from each of the cases to determine patterns and variations in the different elements over time related to the intended audiences, aims, genre and editing rules characterizing the communication of research findings in policy documents.

In order to conduct the cross-case analysis, I returned to the coding of each of the three cases individually to compare significant patterns in the ways in which the research findings were translated into policy documents. I identified which elements of communication were similar and different across the cases, and examined how they were conveyed in the segments of text. The purpose of this stage of analysis was to compare and contrast the within case patterns of communication as a way to develop broader conclusions about how research can be translated into policy. As part of this process, I specifically attended to both commonalities and variations across the cases. Once these commonalities and variations were identified, I turned back to the individual cases in order to better understand communicative pathways of translation. For example, policy documents for all the cases used terms like ‘addiction’ and ‘mental health’, but the ways in which scientific research was incorporated into policy documents for each case varied and were slightly different.

I compared each of the cases in terms of the SPEAKING elements; their dates of publication, authoring ministries, intended audiences and aims, genres, and instruments, in the form of editing rules, were all contrasted and compared. For example, within the third case, Concurrent Disorders, Alberta Health published many more policy documents than did Alberta Education. These publications tended to engage formulation rules of labels and definitions that vary between documents, rather than the fairly routine metaphors and narratives found in the other two cases. Further, compared to the other two cases, fewer documents were produced overall, and particularly relative to the first case, Adverse Childhood Experiences (ACEs), publications from the ministries related to the third case involving neuroscience research of Concurrent Disorders dwindle notably as time progresses. Additionally, whereas the other two cases exhibit intended consumption by multiple and varied audiences, the Concurrent Disorders case tends to remain solely aimed toward practitioner audiences and is considerably less coherent in its presentation of cause-and-effect explanations, as well as proposals of problems and appropriate solutions. Overall, I systematically organized data for each of the case analyses using a table divided into the SPEAKING elements of each document for each case. For cross-case analysis, these elements for each set of tables were then compared, outlining the similarities and differences found across and between the cases.

Credibility and Quality

I maintained credibility and quality of this study through a rigorous methodological approach and process (Mayring, 2003; 2014; Patton, 1999; 2002). I used a purposive sampling, collection and analysis method in order to capture and include all documents that adequately contribute to the research focus of this project on the translation of novel scientific research knowledge into policy. A purposive sampling strategy allowed me to focus analysis and capture the information-

rich nature of the three cases in both depth and detail (Patton, 1999; 2002). Cases were rigorously selected according to specific boundary conditions in order to capture sufficient data and shed light on the research question guiding this study, and were based on a comprehensive review of the scientific literature from brain and neuroscience relevant to the topic at hand. Data analysis was systematic and rigorous, and was meticulously recorded and managed. Constant verification of category definitions and content ensured that they represented the textual data that they were composed of, and worked to avoid reductionist interpretations.

During cross-case comparisons, I engaged in triangulation across the cases to determine whether the patterns and variations were consistent with broader discussions of the neuroscience of addiction and mental health, as well as translation theory more generally. Triangulation (Erlandson, Harris, Skipper, & Allen, 1993; Stemler, 2001) between various levels and forms of archival and documentary data, as well as informal conversations with key field actors, helped to corroborate, extend and challenge my interpretations throughout the data process. For example, while I had not initially included the term “well-being” in analysis, through triangulation of data sources, I came to realize that in some situations, this term is used to refer to “mental health” or “addiction” using different language, and was thus a necessary term to include in analysis. In all, these measures enhanced the credibility, authenticity and trustworthiness of findings derived from interpretation and coding of the data.

In order to elucidate translation processes, I specified observable elements of communication, the findings for which are detailed in Chapter 4, that enabled me to describe relational and contextual patterns among and between the eras and cases identified previously. I relied upon a

modified version of the analytical tools of the SPEAKING grid (Hymes, 1974) by attending to not only speech codes, but also the editing rules of context, logic and formulation proposed by Sahlin and Wedlin (2008) found throughout the text segments. The goal of this approach was to, after analyzing each case individually, systematically analyze patterns of communicative activity found within policy documents throughout time in relation to translation processes. In the next chapter, I describe the findings of the stages of data analysis.

CHAPTER IV: FINDINGS

In the previous chapter, I explained my methodology and how, for each case, I used the SPEAKING model (Please see TABLE 6) to analyze the elements of communication in policy documents, including the editing rules of translation, related to each case. In the analysis that follows, I firstly provide an overview of my findings for each case separately. Then, I report on the results of comparing and contrasting the findings from each of the three cases, across phases. This allowed me to examine the overall pattern of communication underlying translation in each case, and consider similarities and differences within each phase across cases. Thus, for each phase, I compared across cases with respect to the authors and audiences, aims, types of document and the editing rules that characterized the translation of research findings into policy documents. By examining the commonalities and variations across cases within each phase, I was able to reveal the contrasting translation pathways for each case. In this chapter, I describe these different patterns broadly, and then elaborate the more specific similarities and differences revealed through the cross-case analysis of the SPEAKING elements. Altogether, I found that the communication patterns for each of the three cases resulted in three different translation pathways: direct translation, scattered translation, and lost translation. I explain the patterns that I observed below.

Overview of ACEs

As previously discussed in Chapter 3, the 1998 Adverse Childhood Experiences (ACE) Study (Felitti et al., 1998) was ground-breaking research in understanding addictions and mental health because it demonstrated that heightened exposure to stress during childhood was highly correlated with increased lifelong neurobiological, mental and physical health issues. These peer-reviewed findings have been cited by a multitude of renowned researchers in several prominent

academic journals, as well as within policy publications (the current citation count is 14370). As I explain in what follows, how the research findings constituting this case have been well and directly translated into policy. This is revealed by the frequency and forcefulness with which the research findings are discussed within policy documents over time.

Overall, I observed that the pattern of communication related to the ACEs research resulted in its consistent and direct translation into policy and was influenced by the involvement of a third party non-governmental group, the Alberta Family Wellness Initiative (AFWI) (Please see TABLES 7 and 8). The efforts of AFWI aimed to inform a range of stakeholders, including policymakers, about the science of early brain development in order to promote evidence-based decision-making. My analysis of the SPEAKING elements of setting, participants, ends, instruments and genre (Please see TABLE 6: S.P.E.A.K.I.N.G ELEMENTS OF SPEECH EVENTS), incorporating the editing rules of translation, shows that the types of rationales and linguistic tools used to convey ACEs research evolved over time, as did the audiences, types of policy documents and their intended goals.

As shown in TABLE 7, there was no mention of the ACEs research in policy documents for 10 years. Then, in what I term Phase 1, policy documents began incorporating discussions of ACEs research from Alberta Health and primarily focused on providing information in reports and fact sheets about this research for policymaker audiences. Research was broadly contextualized via direct importation of science-based terminology and labels. These terms and labels were used in order to provide cause-and-effect rationales that explained and problematized the relationship

between early experiences and mental health and addiction issues. For example, a 2008 policy document about depression states that:

“Early experiences in childhood and adolescence can play a critical role in development of depression. [...] Traumatic events in childhood (e.g., abuse, neglect, and household dysfunction) have an impact on physical and mental health throughout a person’s life.” [Consensus Statement on Depression in Adults; 2008; pp: 7]

While some preliminary projects were proposed in these early policy documents, specific actions to resolve issues associated with adverse childhood experiences were not regularly included.

Instead, documents set out the need for further research in order to understand how to best implement appropriate prevention and intervention initiatives and activities as a means to promote optimal early childhood development and mitigate risks of addiction and mental health issues later in life. For example, one report on health research in Alberta from 2010 states:

“Decades of brain research document the role of early experience in determining emotional well-being [...]. [However,] research is needed into all aspects of children’s health, development and well-being, including [...] mental health [...and] research is needed into those initiatives that best improve the health, development and education of young children.” [AHIRIS Report; Report; 2010; pp. 23]

In Phase 2, the types of policy documents published by Alberta Health and Alberta Education that communicated information about ACEs research included plans, strategies, and routine publications for both policymakers and the general public. These documents commonly contextualized current research on ACEs by reviewing the correlation between addiction and mental illnesses with early and chronic activation of stress responses caused by toxic stress. Policy documents from this second phase began to consistently incorporate the metaphors crafted by AFWI. In addition, there was continued use of labels directly imported from research that is evident in the discussion of science-based relationships. These metaphors and labels were incorporated into arguments that convey the importance of providing positive environments and caring relationships across service provision. They were used to simplify science concepts in a way that could resonate with audiences and promote common language and understanding

amongst them. By incorporating these metaphors, as well as the directly imported labels, both Alberta Health and Alberta Education began to more clearly develop specific strategies and activities toward improving service care that promotes healthy early brain development in children, as well as to make recommendations around their implementation. The following excerpt from a 2011 report illustrates the use of metaphors to relay activities that can be undertaken to mitigate negative effects from early experiences of ‘toxic stress’:

“Not only does toxic stress affect brain development during a given stage, it affects the next stage and all other stages that build on earlier development. Like a brick wall, when one brick is set badly the whole structure is affected. Harm builds upon harm. [...] Young children who experience toxic stress [...] need more targeted and intensive interventions [...] that can help to prevent disruptions in development and promote better outcomes. [Let’s Talk About the Early Years; Report; 2011; pp. 18]

Lastly, analysis of Phase 3 shows that the ACEs research was fully embedded and widely communicated within a range of types of policy documents for various audiences. Also, specific to this era, documents produced for practitioner audiences in resource guides and tool kits included labels directly imported from science as well as the carefully crafted AFWI metaphors. In Alberta Health policy documents, the ACEs research was contextualized broadly to endorse the now common understanding of the science behind how the brain changes when exposed to toxic stress. This was done by communicating the importance of these science-based relationships for various activities involving prevention, intervention and treatment of mental health and addiction issues amongst practitioner, policy-maker and general audiences, including specific trauma-informed practices. Alberta Education policy documents increasingly began to include the metaphors constructed by AFWI in their more routine conversations of the ACEs research. The documents also began to provide more specific strategies and activities that educators could engage in to promote healthy brain development and positive relationships in their classrooms in order to buffer the negative effects of adverse childhood experiences and

toxic stress by increasing various protective factors including student resiliency. For both ministries, policy documents including conversations of the ACEs research discussed various research-based programs, practices and activities that can be implemented that work to enhance healthy brain development during childhood in order to mitigate risks of developing later mental health and addiction problems.

For example, a resource guide from Alberta Education outlines the importance of ‘creating safe, supporting learning environments’ for educators, who can ‘act as a buffer’ and mitigate effects of ‘toxic stress’:

“Toxic stress can derail healthy development and can result in trauma. This is especially true when a student has no caring adult to act as a buffer. [...] When educators understand trauma, they [...] reduce punitive types of responses that can re-traumatize students. Creating safe, supportive learning environments and developing positive relationships with students who have experienced trauma plays a key role in mitigating its effects.” [Trauma Informed Practice; Conversation Guide; 2016; pp. 1]

In summary, I observed that the communication pattern underlying the translation of ACEs research into policy initially involved explanation of research for policy makers, and was then consistently used as a foundation from which to develop policy, particularly as a result of involvement of the third party AFWI organization. At first, the ACEs research was mentioned by policy documents aimed to provide information for decision-makers regarding the science of early brain development as correlated with later addiction and mental health issues. Over all of the phases, labels, terminology and definitions were consistently and clearly imported directly from science in order to convey information about research for Albertan audiences. Eventually, the language and metaphors carefully crafted by AFWI became fully embedded within a wide range of policy documents communicating about ACEs research and its relationship to mental

health and addiction, as well as prescribing various research based activities, for multiple and varying audiences.

Overview of Origins of Addiction

As discussed earlier in Chapter 3, the 1997 Drug Abuse article published by Koob et al. was foundational because it provided an important framework for understanding the neurobiological factors associated with addiction and vulnerability to drug abuse. This peer-reviewed article, published in one of the world's top academic science journals, highlighted seminal neuroscience research findings demonstrating the neural basis of addiction and emphasized the brain origins of addiction. It has been widely cited by researchers in a range of prominent academic journal articles (the current citation count is 3109), and eventually became the dominant way of understanding addiction, as a disorder of the brain, which has since been supported by extant researchers in the field, as well as integrated within a multitude of policy publications. As I explicate, these research findings have been translated into policy, but they became scattered, as displayed by the multiplicity with which such research findings are communicated within policy documents over time.

I found that the pattern of communication related to the research about the origins of addiction resulted in varied and scattered translation into policy, and was influenced by both emergent issues facing Albertans as well as involvement of the third party group AFWI (Please see TABLES 9 and 10). My analysis of the SPEAKING elements, which included the editing rules of translation, revealed that the rationales around the relationships between the brain and addiction and the language used to convey them changed as time progressed, as did the audiences, genres of policy documents and their desired ends.

As seen in TABLES 9 and 10, there was no mention of the brain origins of addiction for 10 years. Then, Phase 1 policy documents with text related to the science of the origins of addiction from Alberta Health introduced information about addiction and its origins for policymaker consumption. Further, documents types included recommendations based on the research, and a plan in order to address addiction related issues. Documents from Alberta Education were produced for students and parents in a learning module and tool kit that explicate the brain science of addiction for these audiences. Documents from both ministries from this time describe how exposure to drugs causes changes to the brain that, in turn, cause addiction. This can be seen in a learning module published for students that says:

“All drugs of abuse [...] primarily affect the brain’s limbic system. Scientists call this the “reward” system. [...] Drug abuse and addiction lead to long-term changes in the brain [...] and [...] cause drug users to lose the ability to control their drug use. [...] Drug addiction is a disease [...] here is no cure for drug addiction, but it is a treatable disease; drug addicts can recover.” [Career and Life Management; Learning Module; 2008; pp. 136]

The problem of how to respond to extant neuroscience research implicating the brain in the origins of addiction is heavily tied to solutions involving prevention, intervention and treatment approaches within the documents from Alberta Health. Only during the first phase does the Ministry of Education directly incorporate specific neural explanations of the relationship between the brain and addiction in its publications. The communicated roles of service care providers and practitioners during these early years primarily involved understanding the brain damage explanation of addiction. Solutions typically revolved around the development of appropriate policies and services, as well as the provision of nurturing safe learning environments to circumvent risk factors associated with the origins of addiction. Documents used science-based labels like ‘chronic brain disease’ and provided definitions of addiction that explain this label.

In Phase 2, publications intended for general and caregiver audiences, as well as practitioners, began to be published that delved into the science of the origins of addiction. The aim of all policy documents produced during this time was to provide information for audiences in order to promote science and evidence-based decision-making. Research was contextualized during Phase 2 in order to make arguments about the experience-dependent nature of addiction, rather than the substance-dependent rationales provided in earlier years. The idea that brain dysfunction underlies addiction was prominent in all policy explanations of addiction, but during this second phase, the role of environmental factors in substance abuse disorders became more pronounced. Increasingly specific strategies and practices addressing these environmental factors as prevention and intervention activities were communicated. Beginning in the second phase, labels and metaphors derived from AFWI began to appear in policy documents in communications about how experiences of stress causes dysfunctional changes to the brain that, in turn, increase vulnerability to addiction. Similar to the first phase, addiction was likened to other chronic illnesses, but metaphors related to ACEs, like ‘brain architecture’ and ‘faultlines’ became increasingly employed to explain brain abnormalities involved with addiction, as seen in the following Apple Magazine excerpt from 2012:

“Addiction is a chronic condition that affects the brain’s reward and motivation systems. But well before an addiction takes hold, brain development plays a critical role in a person’s susceptibility to addiction in the first place. Early childhood experiences [...] can alter brain architecture in ways that may make addiction more likely. [Special Issue Our Brains Apple Magazine; Routine Publication; 2012; pp. 13]

Phase 3 policy documents, including routine publications, recommendations, tool kits, frameworks and plans, made multiple and varied, but related, arguments. These arguments entailed the logic that underlying brain and neural abnormalities cause mental illness and addiction. However, another version of the argument, also found in Phase 1, was based on drug

use causing brain dysfunction, and was presented in some documents that made recommendations about legislation regarding substances like cannabis. Yet other arguments, based on relationships between addiction, neural abnormalities and academic success were made to justify activities around supporting student well-being, as this passage shows:

Addiction is defined as a primary, chronic, neurobiological disease, with genetic, psychosocial and environmental factors that contribute to its development. [...] Academic success is increasingly being linked to mental health and wellbeing. [...]. Mental health and addiction problems can lead to student drop-out, isolation, increased substance use, poor sleep quality and thoughts of suicide [...]. Given these links, it is important for post-secondary institutions to be aware of effective strategies to promote student mental health and wellbeing. [Alberta Post-Secondary Mental Health and Addiction Framework; 2015; framework; pp. 7-8]

The argument contained within the above excerpt is that addiction and mental health issues can lead to increased substance abuse and mental health problems, which affect academic success, and can be addressed through strategies that promote student well-being.

Multiple and varied, but related intervention strategies become increasingly evident in policy communications for public audiences. These solution-based strategies were based on evidence from science about the origins of addiction, and were advocated and implemented during this time. Strategy and guideline documents from Alberta Education provided specific intervention strategies aimed at improving academic success, which was also linked to adult wellness and prevention of addiction. The incorporation of labels directly imported from science and metaphors developed by AFWI remained evident throughout both the second and third phases. However, these labels and metaphors were used to make arguments that employed a variety of explanations that involved fragmented and scattered incorporations of original research.

Overview of Concurrent Disorders

Research by Markou, Kosten & Koob (1998) details the common etiology and neural structures underlying both mental health and addiction issues, meaning that these ‘concurrent disorders’

often present simultaneously within afflicted individuals. As discussed in the 1998 article, this research has implications for the provision of intervention and treatment services for addiction and mental health disorders; understanding the relationship between mental health and substance abuse allows for the development of more effective services that address both issues. This peer-reviewed article is widely cited by numerous scholars and researchers in the field of the neurobiology of addiction and mental illness (the current citation count is 940), and was published in a leading and well-renowned academic journal. In my analysis of policy documents, after a gap of six years, I initially found frequent mention of the research within policy documents. However, despite initial government efforts to reflect this knowledge via development of integrated treatment services for those with concurrent addiction and mental health disorders in Alberta, the prominence and cogency of this topic significantly declined over time. Eventually, evidence of the original research disappeared entirely, and was no longer evident within the communications of provincial government ministries.

In all, the data for Case 3 shows that the pattern of communication related to concurrent disorders research resulted in lost translation, whereby the topic disappeared entirely from policy documents over time (Please see Tables 11 and 12). Through analysis of the elements of SPEAKING, including the editing rules of translation, I observed that the types and aims of policy documents changed over time. Further, the rationales around the correlative relationship between concurrent addiction and mental health disorders and the language used to communicate about this relationship varied widely throughout the three phases.

As shown in TABLE 11, there was no mention of the concurrent disorders research in policy documents for six years after its initial publication. Then, the first phase policy documents that contained text related to research on concurrent disorders provided only basic information on co-occurring addiction and mental health issues. These documents were produced primarily for practitioner audiences, but also for decision-makers. These publications provided vague recommendations regarding service care provision. Documents from this phase described the relationship between addiction and mental health problems, and their prevalence rates, in order to convince audiences that these disorders ought to be treated together, rather than as separate disorders. However, while the correlation between mental illnesses and addictions was detailed, causal explanations underlying this relationship were unclear. Further, there was a marked lack of understanding how to effectively integrate services in order to appropriately address this correlation between addiction and mental health disorders, as can be seen in this selection from a 2010 strategy document:

“The interplay between mental health and addictions is significant. For example, over 50 per cent of adolescent patients seen in psychiatric clinics use substances; and people with anxiety disorders are two to five times more likely to have a problem with drugs or alcohol. Further research is needed on how the two disorders co-occur and are intertwined through neurological mechanisms and how they can be treated using an integrated and unified approach.” [Alberta’s Health Research and Innovation Strategy; Strategy; 2010; pp. 24]

Current activities involving separate treatment practices were problematized, but the issue of how to effectively integrate services for concurrent disorders was not presented with any clarity in policy documents. The role of researchers and practitioners in policy documents from Phase 1 involved calls to improve understanding about the interrelationship between addiction and mental health in order to improve services for people with concurrent disorders in such a way as to align with existing evidence and research. Documents used research-based, but varying,

terminology and labels to refer to simultaneous addiction and mental health issues including: ‘concurrent disorders’, ‘co-morbidity’, ‘co-occurring disorders’, and ‘dual diagnosis’.

Phase 2 policy documents were again produced for practitioners, as well as policymakers and one document was published for general public audiences in the form of a strategy document, a report, guidelines and a toolkit and a report. The aims of these policy documents were to provide information about addiction and mental health disorders. Further, information was provided about various best models of practice that could be implemented in order to reduce prevalence rates of concurrent disorders, but specific activities that audiences could enact were missing. The extant problem of how to better integrate services for patients with concurrent mental health and addiction disorders persisted during this time, but actionable solutions were not provided. For example, this passage indicates that increasing concurrent-capable services is important for strengthening care for populations with concurrent disorders, but does not delve into how this could be accomplished:

“The high prevalence of concurrent disorders in mental health and addiction settings means that we should consider people coming into service with both these disorders as the expectation [...]. When an individual experiences both [...] disorder[s] at the same time, these problems influence each other in their development, [...] severity, [...] response to treatment and their relapse [...]. If a health-care provider attempts to treat either disorder without recognizing and responding to [both...], the treatment is likely to be less effective. The capacity of a system to organize concurrent-capable services as a minimum standard is critical to strengthening the efficiency and efficacy of service delivery to the addiction and mental health population.” [Enhancing Concurrent Capability; Toolkit; 2013; pp. 5]

Like the first phase, Phase 2 documents employed varying terms and labels that were imported from research to convey information about concurrent disorders, but mostly as they related to other policy issues. Further, a unified or common definition or understanding of the relationship between addiction and mental health issues was missing, particularly in relation to neuro and

brain science found within these documents. This is demonstrated in an excerpt from a 2014 practitioner resource guide related to problem drinking:

“There is no one reason why people with mental illness are more prone than others to problem drinking or dependence on alcohol. [...]ne theory [...] suggest[s] that the neurological basis of mental illness may be very similar to that of alcohol dependence. [...]his shared neurobiological basis means that the same treatment and prevention strategies could be used both to improve mental health and to reduce alcohol dependence. A combined therapeutic approach would treat the mental illness and the drinking problem at the same time [...]” [Alcohol and Mental Illness; Resource Guide; 2014; pp. 7]

Similar to the document that contained the passage above, most policy documents that integrated the topic of concurrent disorders dealt not with that issue itself, but rather, pertained primarily to other policy issues such as suicide, tobacco use, problem drinking or ADHD. There was only one document, *Apple Magazine*, that used metaphors to communicate about the research on concurrent disorders, although this was done in a tangential way, wherein addiction was subsumed by broader mental health concerns.

During Phase 3, the research-based language on concurrent disorders disappeared from policy documents. Documents that even vaguely discussed concurrent addiction and mental health issues were published for practitioners and policymakers and included reports and a recommendation. These documents were produced with the aim of providing evidence-based information in order to improve the health and well-being of Albertans and to support particular policy development activities. Unique to third phase policy documents, the terminology of ‘concurrent disorders’ and its definitions were no longer communicated within, and disappeared altogether from, policy documents. Further, the arguments around problematic prevalence rates of these disorders shifted toward problematizing mental health broadly, which includes addiction disorders. The language used distinctly changed toward the use of ‘mental health’ to make arguments about intervention and prevention activities and supports that aimed to optimize mental health and mitigate risks for later mental illness and addiction issues.

In sum, the data for Case 3 shows that the pattern of communication involved in the translation of concurrent disorders research was characterized by initial uptake, but then a gradual disappearance. The intended audiences and aims, types of policy documents and the rationales and language used to communicate about concurrent addiction and mental health disorders varied both within and between the phases as important policy issues were undertaken (Please see TABLE 6). Initially, the science of concurrent disorders was communicated in policy texts by importing explanations, but lacked clarity or consistency, and was used to make arguments about the integration of services for addiction and mental health. However, these arguments were never linked to clear presentation of actions that could be taken in order to accomplish goals of integrated service provision. Over time, the terminology of ‘concurrent disorders’ and their science-based explanations became lost, were dropped altogether from policy documents, and the topic became subsumed by broader conversations of mental health, which included addiction issues.

Overall Patterns of Translation

In the previous sections of the Findings Chapter, I reported my analysis of each case according to phases marked by start and end dates. These phases were used to provide a consistent framework for cross-case analysis, since the setting was the same for each phase. That is, each phase was characterized by particular governmental leadership as well as a similar public climate regarding appropriate policy approaches for mental health and addiction. Each of the three cases began with reliable and well-renowned research findings. The lag between initial research publication and its inclusion and recognition within policy documents varied between six years for the third case and 10 years for the first two cases. Across all three cases, Phase 1 started when the research

was first included in policy documents using terminology, labels and definitions that were directly imported from science. However, despite these similarities at the beginning, the research findings demarcating each case underwent very different patterns of communication as they were translated into policy. Case 1 revealed a pattern of *Direct Translation*, Case 2 showed *Scattered Translation*, and Case 3 showed *Lost Translation*. I explain these patterns below, and the schematic representation of these three patterns is shown in FIGURES 2 and 3.

Comparisons Across Cases for Each Phase

As discussed above, the setting and context for all cases were the same, which makes it even more surprising that the three cases, all based on well-founded research important to policy, went through different translation processes. As I will explain, the uptake of this research into policy was largely dependent upon the patterns of communication involved with each case, and the manner in which the editing rules of translation were employed within policy documents.

Phase 0 (Lag Between Research Publication and Inclusion into Policy)

For all cases, Phase 0 represented the time period between the original publication of research findings and their initial inclusion into policy, and was characterized by Progressive Conservative leadership in Alberta with a focus on debt reduction and budget balancing. There was a 10-year lag between the major research findings from brain and neurosciences into their incorporation into policy documents during the first phase for the first two *direct* ACEs and *scattered* Origins cases. Interestingly, the shortest lag occurred in the *lost* Concurrent case, which saw initial mention in provincial policy six years after brain science findings indicated overlapping neural pathways involved in both addictions and mental illnesses.

Phase 1 (Imported Labels Introduced)

Setting

The setting (time, place and context – Please see TABLE 6) for phase 1 was characterized by Progressive Conservative leadership in the province. The primary concern around healthcare in Phase 1 was amalgamation of regional health authorities into one health board, Alberta Health Services (AHS). This also included integration of addiction and mental health services into health services and a focus on youth populations.

Participants

In terms of participants (authors and audiences) I found that the primary target audience of Phase 1 policy documents that contained text related to both *Direct Translation* (Case 1) and *Scattered Translation* (Case 2) was policy and decision-makers. Documents during this time were typically published in order to provide information about research for within ministry audiences. One policy document produced during Phase 1 related to *Direct Translation* (Case 1) was also intended for researchers in an effort to convince this audience of the need for more research in order to help policymakers better understand how to put research into action. Practitioners were also intended audiences for policy documents related to *Scattered Translation* (Case 2) and *Lost Translation* (Case 3), but not for *Direct Translation* (Case 1). The *scattered* (Case 2) case was the only one wherein documents were published for student consumption during Phase 1.

Ends

For the ends (aims of communication) throughout Phase 1 for all three cases, I observed that policy documents were published with the general goal of improving services and decision-making by providing information and making recommendations based on current research. In the first *direct* case, policy documents also aimed to allocate resources, funding and direction for research-based initiatives. Phase 1 documents related to the *scattered* (Case 2) case were specifically produced in order to re-align Albertan perceptions of addiction with scientific

evidence of addiction as a disorder of the brain. In the *lost* (Case 3) case, policy documents were produced with the aim of making recommendations guiding evidence-based activities for both policymakers and practitioners.

Genre

In terms of the genres (types of communications) of documents produced by Alberta ministries during Phase 1 related to the research findings that were the foundation for each case, I observed that for all cases, information guides and fact sheets were published in order to provide information for audiences. In the *direct* (Case 1) case primarily information guides, but also reports and a plan were published in order to provide information about research for policymakers and researchers. These types of documents were similar to those published related to the *scattered* (Case 2), except that this second case also included a learning module written for students that contained information about current research on addiction. However, in the *lost* (Case 3) case, a wider variety and larger volume of policy documents were produced during the first phase related to the research on concurrent disorders, and included learning modules, an information supplement, a recommendation, a plan, a review and a strategy document.

Instruments (how messages are conveyed)

Context

For all cases, I found that research was contextualized in Phase 1 policy documents in order to convince Albertans of its relevance for improved services, care and overall health and well-being of populations in the province. For the *direct translation* (Case 1) case, policy documents clearly and consistently communicated that current research demonstrates that early childhood experiences, including exposure to trauma or abuse, are correlated with negative changes to brain development and play an important role in mental health and addiction in the province, and that

fostering healthy childhood brain development was important for prevention and intervention of these disorders. For the second *scattered translation* case, ministries relayed information about addiction as a brain disease in order to convince audiences to change the ways in which the issue of addiction was addressed in the province. This can be seen in the following excerpt from a 2008 report regarding mental health and addiction expenditures in Alberta:

“... [addiction] advocates will be more effective in influencing expenditures [...] if they can change policymakers’ perceptions of the personal responsibility [...] Research has shown “perceptions of personal responsibility to be the single greatest correlate of the values driving decisions about resource allocation.”[...]” [How Much Should We Spend on Mental Health?; Report; 2008; pp. 31]

Additionally, policy documents from the first phase routinely and clearly communicated about research findings indicating that drug use is correlated with chronic brain alterations that cause addiction. This was done to make arguments for the development of evidence-based approaches to treating addiction as a chronic brain disease in Alberta. However, while Phase 1 documents produced related to the third *lost translation* case consistently maintained that research shows significant interplay of addiction and mental health issues amongst Albertan populations, there was a distinct lack of clarity and a great deal of uncertainty was communicated regarding the neurological mechanisms underlying concurrent disorders and how to use this information to effectively improve treatment services in the province.

Logic

Throughout all three cases, my analysis revealed that research-based rationales of cause and effect relationships were communicated in order to then posit various problems associated with these relationships and to propose solutions in order to address the problems. However, the ways in which these relationships were communicated about were different between the cases. These different patterns of logic rules resulted in varying degrees of success in terms of the translation process overall.

In the most salient *direct translation* case (Case 1), rationales were directly imported from research, and were consistently and coherently communicated about within policy documents across all phases. Rationales for this case throughout the phases, including in Phase 1, involved making arguments about the relationship between negative early experiences and later mental health and addiction issues. These arguments were then cogently linked to various evidence-based prevention and intervention activities. Such arguments were regularly and consistently made in order to persuade Albertan audiences of the importance of fostering healthy brain development during childhood. In particular, during the first phase, these audiences were encouraged to engage in activities that facilitate protective factors for children, such as providing positive and safe environments and nurturing, caring relationships, associated with well-being in order to mitigate risks of later problems associated with mental health. However, while policy documents clearly communicated about the need to optimize childhood development, specific activities that could be enacted by audiences in order to do so were not as clearly laid out early on compared to later phases.

For the *scattered translation* case (Case 1), arguments about the brain origins of addiction were consistently conveyed, but the rationales supporting these arguments varied throughout the phases. For example, initially during Phase 1, rationales about how drugs cause changes to the brain that correlate with addiction were provided in an effort to convince audiences about the brain basis of addiction, and to impel them to change the way decisions were made regarding treatment of the chronic brain disease. However, as I will explain, these rationales shifted over time, and were used to make alternate, but related, arguments regarding the origins of addiction and to justify various and multiple evidence-based activities.

The third *lost translation* case was characterized by uncertainty throughout Phase 1 in the research-based cause and effect rationales presented about research in policy documents. It was unclear exactly what the precise causal mechanisms behind concurrent disorders were, but research was consistently communicated during this time by arguing that they are linked by similar neural circuitry, and that their prevalence rates in the province was high. This argument was initially, during the first phase, communicated to persuade audiences of the need to integrate treatment services in an effort to provide more appropriate, evidence-based treatment services for patients with concurrent addiction and mental health disorders. However, the issue of how to implement such solution-based activities distinctly lacked clarity in related Phase 1 policy documents. For example, the lack of understanding of how to execute research into actionable solutions appears in a 2007 information supplement produced for healthcare professionals:

“[...L]arge numbers of people with mental illness also struggle with substance abuse [...and...] services, have traditionally operated in their own silos—often to the detriment of patients who suffer from what is commonly referred to as “concurrent disorders.” There is now almost universal agreement that this must end. There is less consensus on how this can be done.” [Mending Minds; Information supplement; 2007; pp. 12]

Formulation

All three cases exhibited the use of terminology, labels and definitions directly imported from research in policy documents during Phase 1. However, I found that the uniformity and cogency with which these terms and labels were used to communicate about research varied widely between the cases, and influenced the resultant uptake of research into policy. In the *direct* (Case 1) and *scattered* (Case 2) cases, labels were directly imported from science, and were routinely used to convey the importance of research for audiences throughout all three phases.

To exemplify, a 2010 fact sheet produced for decision-makers within education contexts imports labels from research to explain the relationship between early experiences and life-long health and well-being:

“A child’s early experiences [...] shape the structure of the rapidly developing brain. The quality of early experiences is influenced by the environments in which children are raised. Children who have access to nurturing, stimulating and safe environments [...] experience better health, learning, relationships and well-being. [ECMap Fact Sheet; 2010; pp. 1]

I observed a different pattern of language use in the third *lost translation* case. While terminology, labels and definitions used to relay information about the research on concurrent disorders were imported from research, they were multiple and varying throughout Phase 1, as well as the entirety of the dataset. Multiple terms and definitions were communicated both within and between policy documents to describe the same thing. For this case, a unified language that characterized ministry communications related to the research on concurrent disorders was missing.

Phase 2 (Rise of Simplifying Metaphors and Explanatory Narratives)

Setting

Phase 2, like Phase 1, was characterized by Progressive Conservative leadership in the province. During Phase 2, transparency and cost reduction were central issues. Further, intervention and prevention activities for youth populations became important factors in reducing the costs associated with later addiction and mental health disorders.

Participants

In the two most successful translation cases, the *direct* (Case 1) and the *scattered* (Case 2) *translation* cases, I observed a clear pattern of intended audiences of policy documents that included text related to relevant research, whereby they became increasingly varied during Phase 2 to include general public, practitioner and policy-maker audiences. However, in the least

successful case, the *lost translation* (Case 3) case, target audiences became much less broad throughout the second phase compared to Phase 1, and typically focused on practitioner, and sometimes, policy-maker audiences.

Ends

Similar to the first phase, during Phase 2 for all three cases, my analyses indicated that policy documents were published with the general goal of improving services and decision-making by providing information and making recommendations based on current research. In the *direct* and *scattered translation* cases, policy documents progressively began to be published with the goal of increasing research application to services and guiding activities in Alberta that specifically related to addiction and mental health. Further, policy documents related to these two cases aimed to provide resources and promote particular strategies around types of prevention and intervention activities. These activities were geared toward reducing rates of addiction and mental health disorders overall in the province. Similarly, documents relevant to the third *lost translation* case were published with the intention of providing information to guide informed decision-making and making recommendations. These documents contained information regarding treatment and intervention activities that addressed prevalence rates of concurrent disorders in the province.

Genre

I observed similar patterns of types of policy documents published for both the *direct* (Case 1) and the *scattered translation* case (Case 2). In the most robust *direct translation* case (Case 1), an increasingly wider range of document types were published during Phase 2 compared to the first phase. These came in the form of strategic plans, reports and routine publications in the form of magazines and newsletters were published for policymaker, general public and

practitioner groups that promoted a common understanding, language and dialogue around the research and provided information and resources for these audiences. In the *scattered translation* case (Case 2), I observed a pattern similar to the *direct translation* case, except that various learning modules and resource guides were also produced by Alberta ministries during Phase 2. These modules and guides contained information about ongoing research for practitioner audience consumption. Unlike the first two cases that saw an increasing range and number of types of documents published during Phase 2, document types related to the third *lost translation* case became less varied relative to the first phase. These documents included a strategy document, recommendations and guidelines that made arguments about activities that supported the research and aimed to improve understanding of how to integrate research into action. Additionally, contrasting with the other two cases, there were no routine publications, such as newsletters or magazines, from Alberta ministries that directly dealt with the research on concurrent disorders during this time.

Instruments

Context

Like the previous phase, I found that all policy documents that contained text related to each of the three cases contextualized research in order to persuade Albertans of its importance for improving the overall health and well-being of populations in the province. In the *direct translation* (Case 1) case, documents consistently continued to contain arguments that current research shows that addiction and mental illness are correlated with early and prolonged activation of the stress responses caused by toxic stress. These arguments were communicated in order to justify specific activities that could be undertaken by Albertan audiences to promote positive childhood brain development and prevent later mental health issues. To demonstrate, a

passage from a 2014 report that was developed to study the relationships between early childhood environments of Albertan youth and their influence upon development and later mental health states:

“As a large body of scientific research shows, children’s early experiences are “biologically embedded” in their rapidly developing brain and nervous systems and have lifelong consequences on learning, health, productivity and well-being.” [How Are Our Children Doing?; Final Report; 2014; pp. 34]

The argument contained in this excerpt involves the importance of understanding research pointing to the relationship between formative experiences and their long-term consequences for Albertans. This information, related to the ‘large body of scientific research’ based on ACEs findings, is provided with the intention of informing Alberta educators about this research. Further, later in the document, ways in which educational environmental factors can influence development were outlined for educators.

For the second *scattered translation* case, Alberta ministries continued to relay information about science and research that demonstrate addiction is a chronic brain disease. However, rather than the substance-dependent arguments that appeared during Phase 1, policy documents from Phase 2 incorporated more experience-based arguments into their communications. These arguments were communicated in an effort to persuade audiences that addiction, as a brain disease, is rooted in early personal trauma. Further, policy documents from this phase routinely communicated that Albertans ought to be concerned with providing optimal childhood experiences that promote healthy brain development and reduce the risk of later addiction issues provincially. For the third *lost translation* case, research was contextualized by providing research evidence that showed that some Albertan populations are more vulnerable to addiction due to the neurocircuitry associated with particular brain regions involved with risk-taking and mental health problems. The contextualization of research related to this case shifted during

Phase 2, and while, like Phase 1, a primary emphasis was placed upon integrated care of concurrent addiction and mental health disorders, a concern around vulnerable populations and how to appropriately address their specific needs using evidence-based best models of practice emerged.

Logic

In the *direct translation* (Case 1) case, I observed that rationales continued to be directly imported from research, and were consistently and coherently communicated about within policy documents from Phase 2. Rationales for this case throughout the second phase involved making arguments about the relationship between early experiences of toxic stress and later mental health and addiction issues. Like Phase 1, these arguments were consistently and clearly linked to various evidence-based prevention and intervention activities in related Phase 2 policy documents. Such research-based arguments were presented in order to persuade Albertan audiences of the importance of fostering healthy brain development during childhood. Further, these audiences were encouraged to engage in specific evidence-based activities that promote healthy brain development during childhood in order to mitigate and prevent risk factors associated with mental health and addiction disorders.

For the second *scattered translation* case, while explanations of addiction as a chronic disorder of the brain persisted from the first phase, a different rationale emerged within policy documents from Phase 2. The rationales during Phase 2 posited the more experience-based nature of addiction, whereby experiences of trauma and prolonged stress correlate with changes in the brain associated with the development of addiction. This can be seen in an Alberta Education

learning module from 2013 that promoted particular trauma-focused intervention strategies for educators:

“Addiction is functionally viewed as an understandable, unconscious, compulsive use of psychoactive materials in response to abnormal early life experiences [...]. [...A]ddiction is more experience-dependent than substance dependent [...] Adverse Childhood Events may lead to social, emotional, and/or cognitive impairment which contributes to an individual adopting health-risky behaviors [...]” [Trauma Informed Practice; Learning module; 2013; pp. 1-2]

This type of rationale was provided within Phase 2 policy documents in order to argue for evidence-based prevention, treatment and intervention activities and to persuade audiences to engage in specific trauma-informed practices.

The third *lost translation* case continued to be characterized by uncertainty in the research-based cause and effect rationales presented about research in policy documents. Policy documents communicated about the uncertainty of whether addiction causes mental illness or vice versa, but research continued to be discussed via arguments about their similar neural circuitry, and demonstrating high prevalence rates in the province. These arguments, like Phase 1, were communicated to persuade audiences of the need to integrate treatment services, but, unlike the other two cases, research was not clearly linked to actionable solutions for Albertan audiences. Further uncertainty continued to prevail in policy documents regarding how to appropriately implement research into service care provision in Alberta. Also in Phase 2, prevalence rates of the disorders were often used to argue for other, related but separate policy activities around the legislation and regulation of various substances.

Formulation

All policy documents related to the three cases continued to use terminology, labels and definitions directly imported from research in policy documents over time. For the first two *direct* and *scattered translation* cases these labels and terms were used consistently and clearly

during Phase 2. Additionally, metaphors that remained true to research were used to simplify hefty science concepts for a broad range of audiences in such a way that worked to align extant perceptions with current knowledge and guide evidence-based decision-making.

In the *direct* (Case 1) and *scattered* (Case 2) cases, labels continued to be directly imported from science, and were routinely used to convey important research for audiences throughout all three phases. For these first two cases, a third interested party organized the Alberta Family Wellness Initiative (AFWI) and specifically worked to construct and propagate a series of simplifying metaphors for Albertan audiences. These metaphors worked to re-align perceptions of addiction and mental health with current brain science findings about early brain development. This organization developed a series of symposiums, conferences and documents geared toward policymaker, practitioner and researcher audiences. These efforts were extended to promote a common understanding and language around this research and to guide evidence-based decision-making in the province. During Phase 2, we begin to see these science-based metaphors integrated into policy conversations about the research involved with these cases on a regular basis. Such use of metaphors can be seen in a 2012 article from Apple Magazine that describes that ‘cracks in the brain’, or ‘faultlines’ in an effort to explain the science behind how addictions develop:

“[...F]aultlines appear as the brain develops [...] as people experience toxic stress. [...] Just as faultlines in the earth’s core can set off earthquakes, faultlines in the brain can affect brain architecture. [...] Not every faultline in the brain leads to an addiction. Faultlines must be triggered to cause damage. They can also be prevented and minimized. [...] [Special Issue Our Brains ‘Apple Magazine; Routine Publication; 2012; pp 67]

The labels imported from science, alongside the carefully crafted metaphors developed by AFWI were widely used to convey research related to these cases, and become fully embedded within relevant policy documents.

However, I observed a different pattern of language use in the third *lost translation* case during Phase 2. While terminology, labels and definitions were used to relay information about the research on concurrent disorders, they were multiple and varying throughout the entirety of the dataset. Multiple terms and definitions were communicated both within and between policy documents to describe the same thing. Further, rather than dealing explicitly with concurrent disorders, research related to the topic was often communicated in order to highlight different, but similar policy issues including alcohol and tobacco use, cannabis regulation and ADHD. This can be observed in the following passage from a 2013 report that focused on issues related to problem gambling:

“[...M]any problem gamblers often have co-existing mental health or substance use issues. When a person has two or more disorders, this is called co-morbidity [...] When the disorders co-occur, it is often difficult to understand which problem came first, and whether one caused the other. It is also often difficult to ascertain whether providing treatment for one condition would subsequently cause improvements in the co-existing condition. These are important questions that have yet to be fully answered in the research literature.” [Problem Gambling, Mental Health and Suicide; Report; 2013; pp 14]

As seen in the above passage, there was a lack of a unified language that characterized ministry communications related to the research on concurrent disorders. In the end, this indicated that a common understanding of this research was not achieved, and this negatively affected the success of efforts to translate concurrent disorder research into policy over time. In addition, there were no metaphors related to research that were used in policy documents in order to simplify the science of concurrent addiction and mental health disorders for audiences.

Phase 3 (Metaphors Prevail as Placeholders for Science Explanations)

Setting

Phase 3 was marked by a major shift in government leadership in Alberta, when the more leftist New Democratic Party was voted into power. During this time, concerns about provision of and

access to healthcare, including addiction and mental health services, abounded, especially for at risk communities.

Participants

During Phase 3, I found that for the first two *direct* and *scattered translation* cases, policy documents continued to be published for a broad range of general public, practitioner and policy-maker audiences. However, in the third *lost translation* case, policy documents no longer provided information directly relevant to the research on concurrent disorders for any audience. The few policy documents that were produced by Alberta ministries that were even vaguely related to this case targeted practitioner and policymaker audiences, but like the previous phases and unlike the other cases, none included the general public in their intended audience groups.

In all, I observed that the first two *direct* and *scattered translation* cases underwent similar patterns in that initially, policy documents were produced primarily to provide information about current research to within-ministry policymakers. Then, the intended audiences of policy documents became increasingly varied over time to include general public, practitioner and policymaker groups. In the *lost* case, the range of intended audiences was much smaller, and only included policymakers and practitioners. This indicates that targeting firstly decision-makers, and then a multitude of different audience groups in communications about a particular idea is important for successful translation efforts.

Ends

Like the previous phases, all policy documents produced related to the three cases generally aimed to improve the health and well-being of Albertans. For both the *direct* and *scattered translation* cases, policy documents were published with the specific goal of providing

information, resources and recommendations around particular evidence-based prevention, intervention and treatment activities for Albertan audiences. Further, these two cases also saw the publication of specific plans that aimed to address policy recommendations made during prior phases. However, the documents for the *lost translation* case that even remotely involved research on concurrent addiction and mental health disorders were published with distinct goals of evaluating and critiquing existing services and policy. Further, these policy documents aimed to provide information and to make recommendations and guide policy development around other, different issues including cannabis regulation; treatment for neurological disorders; and access to mental health care in educational environments. In all, these patterns suggest that for successful translation, the aim of communications at first were intended to provide information and align perceptions and understandings of important decision-makers. Then document aims moved toward making recommendations for action based on this information, and then to providing appropriate resources and guidelines for action for a range of audiences. Without furnishing audiences with appropriate guidelines and resources in order to show these audiences how to put relevant information into action, translation efforts can become stalled and may fail.

Genre

By Phase 3, a broad variety of types of policy documents related to both the *direct* and *scattered* cases continued to be published and included routine publications, reports, plans and resource guides. These types of documents provided recommendations and resources geared toward multiple audiences and focused on specific science-based activities that supported and enacted current research. For the *lost* case, there were no documents published by Alberta ministries that directly incorporated research on concurrent disorders. However, those that did even vaguely communicate about the topic were much less varied compared to the other two cases, and only

included reports and recommendations produced for practitioners and policymakers. These patterns of types of document type publication over time show that for successful translation, informative documents that provide a basis for understanding amongst audiences are most useful during early stages. Following these informative types of documents, an increasingly broad range of document types produced for multiple audiences can help to facilitate the translation process. On the other hand, the publication of a broad range of documents in early stages, followed by a decreasing range of document types, can hinder the translation process.

Instruments

Context

During the last phase, I observed that research related to the *direct* and *scattered translation* cases continued to be contextualized in order to convince Albertans of its relevance to health and well-being in the province. In the first *direct translation* case, policy documents included research about ACEs that clearly and consistently emphasized the importance of understanding the science behind how the brain changes when exposed to toxic stress for prevention, intervention and treatment of addiction and mental health disorders in the province. For example, a 2015 report states that:

“Understanding how our early experiences shape brain development is important for prevention, intervention, and treatment of addiction and mental illness” [Alberta Mental Health Review; Report; 2015; pp. 22].

The second *scattered translation* case displayed more variability in the contextualization of research compared to the first case. In related policy documents from Phase 3, documents conveyed that current research demonstrates that addiction is a disorder of the brain, but is caused by a variety of early experiences and environments in order to convince audiences of the importance of promoting healthy brain development amongst Albertan populations. Further, Phase 3 policy documents also communicated about how drug use causes brain changes that are

linked to addiction in order to justify particular regulation activities around substances like cannabis in Alberta. Finally, in the *lost translation* (Case 3) case, research was not directly contextualized at all in policy documents. When this topic was even vaguely referred to in policy documents from this time, it was done to make arguments about existing activities in Alberta, and to persuade audiences of the need for changes in service care provision, as well as to make recommendations about other important policy issues in the province. In all, my findings indicate that research that is clearly and consistently contextualized in such a way as to convey its importance and relevance to pertinent audiences can promote successful translation.

Logic

Similar to the previous phases, my analysis showed that, in the *direct translation* (Case 1) case, rationales were directly imported from research, and were consistently and coherently communicated about within policy documents from Phase 3. Rationales were provided in documents to make arguments about the relationship between negative early experiences of toxic stress during childhood and the development of mental health and addiction issues later in life. Such arguments were coherently and cogently linked to specific, actionable solutions in the form of evidence-based prevention and intervention activities. Further, they were regularly and consistently communicated in an effort to convince Albertan audiences of the importance of fostering healthy brain development during childhood. These audiences were routinely encouraged to engage in very specific activities in order to put research into action and improve mental health in Alberta. This is demonstrated in a 2017 resource guide published for educators that provides specific intervention activities that emphasize approaches that can improve student development and help to mitigate negative effects of adverse events:

“Students identified as being at risk for, or experiencing, mental health problems that affect their functioning at some level (home, school and/or community) may need targeted, short-term interventions focusing on skill-building in areas such as managing emotions, focusing attention, resolving conflict or

problem-solving. [...] Targeted strategies are proactive in addressing mental health problems that are typically reactions to life circumstances or events, and that are impacting a students' ability to function.” [Working Together; Resource Guide; 2017; pp. 24]

In Phase 3 documents related to the second *scattered translation* case, I found that multiple different rationales were provided. Multiple and varying rationales were communicated in order to make arguments pertaining to particular prevention and intervention activities that Albertan audiences could undertake in order to reduce risk factors associated with dysfunctional brain changes related to addiction. The rationales from both Phase 1 entailing drug use, brain changes and its correlation to addiction, and Phase 2, which focused on negative early experiences and their role in later addiction issues, were found in Phase 3 documents with text related to the research involved in Case 2. In addition, other alternate rationales involving academic struggles and their link to brain abnormalities and addiction issues were incorporated into policy documents that communicated about the origins of addiction. These rationales were employed in order to make arguments about educational environments and to persuade audiences to make them more inclusive and supportive of overall student well-being, thereby reducing likelihood of later addiction issues.

Altogether, I observed that the use of multiple and varying cause and effect rationales to justify particular solution-based activities can result in scattered translation. Further, without the provision of cogent rationales that are linked to actionable solutions, translation can become lost. However, consistent and clear communication of research-based rationales of cause and effect that are used to support and justify specific, actionable solutions can facilitate translation.

Formulation

Continuing into Phase 3, labels and terminology directly imported from research were incorporated into policy documents related to both the *direct* and *scattered translation* cases. Further, the science-based metaphors developed by AFWI were widely and routinely used in documents to clearly convey research related to the cases. To illustrate, a 2015 article from Apple Magazine published for general public audiences says:

“Addiction [is a] chronic and complex disease that affects a person’s ability to control their dependency on a substance [...] or a behaviour or process [...]. [...] Adverse childhood experiences (ACEs) [...] can weaken the foundation of a child’s brain. [...] The foundation for learning, behaviour and health, brain architecture is like building a house [...]. What we’ve learned in neuroscience in the past 40 or 50 years is that the brain has that capability to be plastic, the capability to be changing, [...] It’s really a profound statement because it means addiction is a brain disorder and recovery is a brain recovery.” [The Story of Childhood Development Apple Magazine; Routine publication; 2015; pp. 35]

This excerpt ties ACEs to the developing brain through the metaphor of ‘brain architecture’ and the imagery of building a house with a strong versus weak foundation. This article provides an easily remembered way for audiences to understand the relationship between early experiences and addiction. This is done using a narrative of building a house that enables the nature and origins of addiction to be visualized and highlights the importance of building a strong foundation, or encouraging healthy brain development. Neuroscience research is contextualized by formulating the brain as plastic and capable of change. This contextualization entails the logical connection between the brain and both addiction and recovery from addiction, and exhibits all three editing rules of context, logic and formulation. For the *lost translation* case, I found no labels or terminology directly related to concurrent disorders that were used in policy documents during Phase 3. Instead, the language of ‘concurrent disorders’ became broadly subsumed by the labels of ‘mental health’ and ‘mental illness’, which includes addiction.

For all three cases I observed the use of terminology, labels and definitions directly imported from research in policy documents over time. However, the uniformity and cogency with which these terms and labels were used to communicate about research varied widely between the

cases, and influenced the resultant uptake of research into policy. Additionally, the use of metaphors that remain true to research can work to simplify hefty science concepts for a broad range of audiences in such a way that works to align extant perceptions with current knowledge and guide evidence-based decision-making. Taking these observations into account, I find that, on the one hand, successful translation efforts involve the use of consistent terminology, labels and definitions that are imported directly from research. Furthermore, translation can be facilitated by the development of metaphors that remain true to and simplify research concepts in order to align audience perceptions and understandings with science. On the other hand, translation efforts can be undermined by the use of multiple and varying terms, labels and definitions, which perhaps work to confuse audiences and lessen the convincingness of arguments made in policy communications.

In the most effective *direct translation* case, policy documents were initially written for ministry audiences in order to summarize and explain brain science research related to addiction and mental health. As time progressed, audiences became broader and included various decision-maker, practitioner, and general public groups. Policy documents directed to both practitioners and the general public became increasingly common over time. These documents clearly and consistently communicated knowledge from brain science research in locally resonant ways that connected research-based cause-and effect rationales to local problems and solutions. This was done, over time, by convincingly incorporating carefully constructed simplifying metaphors and narratives that remained true to the original research in order to justify specific evidence-based activities related to these diverse audiences.

In the *scattered translation* case, after a 10-year lag, labels and terminology were consistently and directly imported from research into policy documents in order to convey information about the brain origins of addiction, but this was done in order to make various different arguments and to justify a variety of related activities over time. Different rationales of cause-and-effect from research were communicated in a less consistent and coherent manner when compared to the *direct* translation case, and resulted in the original research findings becoming *scattered* and less well integrated into policy. Although the *direct* and *scattered* cases saw similar communication patterns in the direct importation of labels and terminology from research and the development of related simplifying metaphors, there was a lack of consistency and coherency in the use of these metaphors and of communications about research involved in the *scattered* case.

Ultimately, this led to less convincing arguments about cause and effect, and justification for relevant evidence-based solutions and activities were multiple and varied in nature. In all, the original research findings from the *scattered* case became imbued with multiple, related meanings that were not as directly conveyed as those from the first *direct* case.

In the least successful translation, or *lost translation*, after a six-year lag following the publication of research, a variety of policy documents were initially published, primarily for practitioner and policy-maker audiences. As time went on, the variety of documents produced declined rapidly until eventually, conversations directly related to research were dropped entirely from policy conversations. Further, there was marked variation in the terminology, labels and definitions, imported from science, that were used both within and between policy documents, and no metaphors were developed or used to simplify science concepts for audiences.

The three cases comprising this study were all based on well-regarded, peer-reviewed research with important policy implications and the setting and context were the same in all cases. My analysis revealed that, despite the initial similarities between the cases, the patterns of communication about research related to each case were different, and this resulted in varying degrees of success in their translation into policy. I found that the translation of research into policy can be characterized as *direct*, *scattered* or *lost*, contingent upon the patterns of communication involved (Please see FIGURE 2: DIAGRAMS FOR EACH CASE PATTERNS OF COMMUNICATION INVOLVED IN THE TRANSLATION OF RESEARCH INTO POLICY). If research is communicated for a narrow range of audiences in a declining range of types of documents using inconsistent terminology and definitions and unclear rationales of cause and effect, without providing actionable solutions to local problems, translation can become *lost*. Even when consistent science-based terminology, labels and simplifying metaphors are employed to convey research, if arguments employ multiple and varying rationales of cause and effect in order to justify actionable solutions to local problems, translation efforts can become *scattered*. However, communication using consistent terms, labels and metaphors that remain true to the original research context in an effort to clearly and cogently make arguments using rationales of cause and effect to provide actionable solutions to local problems for a wide range of audiences in a multitude of documents can facilitate successful, *direct* translation.

CHAPTER V: DISCUSSION

In the previous chapter, I presented the findings from the analysis of each of the three cases as well as the cross-case analysis. In this chapter, I discuss, elaborate upon and evaluate the findings of this study, and discuss the significance and implications of the results. Firstly, I provide a summary of important findings in relation to the original research question guiding this study. Then, I interpret and discuss the results in terms of how my research contributes to the literature on translation. My focus here is on the use of metaphors as meaning repackaging tools and their relevance to translation processes, the editing rules of translation, and the general communication patterns underlying translation. After discussing the limitations of this study, I make recommendations for implementation and future research.

Summary of Findings

The research question guiding this study was: What is the role of communication in the translation of research into policy? In order to answer this question, I employed methods from speech codes theory, and used a multiple case analysis design and qualitative content analysis, guided by the SPEAKING model. I used these tools to systematically analyze policy documents produced by Alberta government ministries that related to three separate brain research findings from the years of 1990 to 2018. In all, my methodology and analysis allowed me to focus on the construction of text as an important factor in knowledge translation. Given that the three research findings were all well-founded and well-regarded within the research world with important implications for policy, and that the setting and context for all three cases was the same, it could be expected that they would demonstrate similar translation processes. However, analysis revealed that these research findings underwent very different patterns of communication as they were translated into policy, resulting in different degrees of success during this process over

time. I did so by tracking policy document communications regarding these research findings from a particular starting point of when the research was initially published and underwent a gap and as they were incorporated into policy.

Understanding how to integrate such research knowledge into tangible improvements within related fields has notoriously been subject to lengthy lags between its development and its implementation (e.g., Graham, Logan et al., 2006; Packer, Simpson & Stevens, 2006; Davis, Evans, Jadad et al., 2003; Rogers, 1995; Evan, 1966; Ogburn, 1922). My cross-case analysis revealed that, approximately 10 years after initial publication of research findings related to the start of the ‘decade of the brain’, ministry publications began to include discussions of brain and neuroscience research. The gap between the publication of research findings and its implementation into policy could be due to many factors. One factor could entail the very different domains that scientific researchers and policy makers operate in; even in the research world, it takes time for other researchers to pick up novel publications of findings. Thus, it makes sense that there would be an even greater lag before professionals in other domains, like policy, would begin to attend to and incorporate such knowledge.

This substantial lag before research became evident in policy documents may further be due to the different roles and interests of researchers and policymakers. Researchers and academics are typically incentivized by the number of peer-reviewed journal articles they are able to publish, as well as the number of times these articles are cited by other academics. The journals that research articles are published in are often costly to access for people who are not immediately associated with an academic institution. The technical language used to write research articles,

along with the modes of publication that these articles undergo is perhaps not as accessible or comprehensible for policymakers that are concerned with more practical aspects of planning and decision-making. Thus, due to the very different environments that academics and policymakers operate within, policymakers may not have the capacity to access new research articles or easily implement their findings into significant policy changes. Following this lag between publication of findings and their communication within policy texts, I found that over time, there was considerable variation in the degree to which research findings were incorporated into policy.

In this dissertation, I wanted to understand the role of communication in the translation of research into policy. As seen in Figure 3, my data shows how varying patterns of communication underlying translation of three separate, but similarly valid and important, sets of research findings resulted in distinctly different pathways of translation (Please see FIGURE 3: SIMPLIFIED FIGURE OF PATTERNS OF TRANSLATION PROCESS FOR EACH CASE). My analyses show that the translation of research into policy can be categorized as *direct*, *scattered* or *lost* depending upon the patterns of communication enacted during the translation process. Overall, I identified the patterns of translation from basic science to policy documents for each scientific research discovery.

I found that the pattern for Case 1 (ACES) was *direct* translation, wherein research was directly, consistently and cogently imported from research into policy over time. Further, I found that in this strongest, *direct* translation case, when metaphors are carefully and purposefully used to clarify research findings, they can act as a robust mechanism for the translation of research into policy. The pattern for Case 2 (ORIGINS) was *scattered* translation, and was characterized by

communication of labels, terminology and rationales imported from research, but these communications were multiple and varied over the phases. In this scattered case, I also found that when metaphors were used haphazardly and without consistency, aspects of the original research were translated, but the process was not as clear as in the *direct* translation case. Finally, the pattern for Case 3 (CONCURRENT) was *lost* translation, whereby multiple terms and labels imported from research were employed initially in policy, but communications about this topic eventually disappeared completely in ministry publications. Additionally, no unique metaphors were developed to explain research findings for audiences of policy documents related to this case. My analysis of these categories of translation showed that the patterned use of different communication strategies and elements in each case helps to explain the differences

The results of this study primarily contribute to theoretical understandings of metaphors as an important mechanism for repackaging and reformulating ideas as they are translated, how different aspects of communication influence the translation process, and the communication patterns underlying translation. In what follows, I discuss and interpret the results of this study, and detail the major contributions and their implications for theory and practice.

Metaphors as Repackaging Tools of Translation

My primary contribution relates to metaphors as a robust mechanism and repackaging tool of translation (Please see FIGURE 4: PROCESS MODEL FOR EFFECTIVE TRANSLATION). Figure 4 provides a schematic representation of how metaphors were used in order to effectively translate novel research findings into policy throughout the phases over time. Along the top portion of the diagram, I indicate the phases of metaphor development. Across the middle section of the diagram, I show how metaphors were employed to communicate about research during the

translation process. Along the bottom portion of the figure, I indicate the shifts in government leadership associated with the phases of metaphor development. In particular, my findings revealed that the deliberate and careful construction of metaphors can facilitate the travel of knowledge from one context into another. I found that the successful translation of research into policy entailed a process whereby initially, after a lag between research publication and policy inclusion, labels directly imported from science were communicated in policy in order to explain the potential value of research findings for policymaker audiences. Then, while these scientific labels continued to be used in policy documents, metaphors were introduced alongside detailed narratives that were used to explain the metaphors as they pertained to the research findings. However, during this time, minimal specific application of these concepts were included in policy communications. Finally, shortened metaphors were increasingly communicated within policy documents, and were used in texts as place holders for research-based explanations. Additionally, the use of detailed narratives to explain these metaphors declined and the use of original, imported scientific labels was minimal. During this last phase, actionable solutions based on research were clarified and outlined for a wide range of policymaker, professional and general public audiences. This resulted in research being directly translated into a wide range of types of policy for multiple local audiences.

My first contribution related to metaphors as a robust mechanism of translation lies in my extension of scholarship that understands the translation of ideas as entailing the provision of ideas that are locally comprehensible (e.g., Boxenbaum, 2006; Czarniawska & Sevón, 1996; 2005) via narrative processes (e.g., Gabriel, 2004; Seefeld & Rese, 2020; Smullen, 2010). I show that the careful construction of cogent metaphors that work to explain original ideas for various

audiences can facilitate translation. Secondly, I diverge from previous scholars who indicate that ideas need to be stripped of their original context in order to resonate with local audiences (e.g., Boxenbaum & Gond, 2014; Gond & Boxenbaum, 2013; Sahlin-Andersson, 1996; Czarniawska & Joerges, 1995; Waldorff, 2013) by demonstrating that metaphors that remain true to their original meaning can facilitate translation. Thirdly, I add to literature that maintains that translation is an effortful activity (e.g., Nicolini, 2010; Piekkari & Tietze, 2014; Pohl et al., 2009; Rovik, 2008; Sahlin-Andersson, 1996) by explicating the use of metaphor that were deliberately and carefully constructed to explain research findings and carry original meaning with them while working to re-align local perceptions. Fourthly, I add insight to scholarship that explains translation in terms of various stages or phases (e.g., Rovik, 2008; Czarniawska & Joerges, 1996; Lindberg & Erlingsdotter, 2005) by explaining the development of metaphors involved in translation over time.

My study reveals the importance of metaphors as a way to promote the translation of research into policy. I build on concepts developed in the previous literature that shows how the agency of translators can be essential in the provision of ideas that are understandable within local contexts (Boxenbaum, 2006; Czarniawska & Sevón, 1996; 2005). Similar to previous studies that show how storytelling and metaphors can be narrative processes that allow for ideas to be understood, meanings managed and realities to be created and communicated (Gabriel, 2004; Seefeld & Rese, 2020; Smullen, 2010), my analysis shows that metaphors can help to smooth translation processes by rendering ideas meaningful for local audiences. My cross-case analysis points to the importance of the development of metaphors that are easier for local audiences to understand than more scientized and technical concepts and explanations. Metaphors can serve to reconstrue

complex ideas within local vernaculars and place concepts in relation to what is already well established and understood.

In addition, my study suggests that, in successful translation, as ideas continue to be translated from one domain into another, they are reformulated and repackaged into more easily comprehended, visualized and remembered labels, metaphors and narratives. Further, during this repackaging, reformulations can lose much of the technical and scientific language that originally characterized research-based explanations. As explained above, during the introductory stages of metaphor development, they can be communicated alongside descriptive narratives in order to explain how these metaphors are connected to the science behind the research findings. The carefully constructed metaphors can eventually, over time, come to stand for the original research knowledge. This is particularly true in the successful *direct* case, where we see the development of meaningful metaphors and stories, and labels to represent them. These can allow local audiences to re-conceptualize concepts in such a way that aligns with emergent research findings and influence evidence-based decision-making on a broad scale. For example, the initial complexity that characterizes emergent research findings can be repackaged under metaphors that simplify knowledge and increase their understandability. Such repackaging of concepts can allow local audiences to more readily visualize, understand and remember the metaphorical narratives used to make the complex and technical language of research more comprehensible.

However, diverging from previous research that indicates that ideas need to be stripped of their original context and made abstract and generalized in order to travel into a new context (e.g.,

Boxenbaum & Gond, 2014; Gond & Boxenbaum, 2013; Sahlin-Andersson, 1996; Czarniawska & Joerges, 1995; Waldorff, 2013), my findings indicate that ideas that are overly abstract, generalized and simplistic may lose their convincingness during translation. I found that meanings conveyed by constructed metaphors that were thoughtfully and carefully managed in order to maintain congruency with their originating context and realign local understandings with scientific explanations facilitated successful translation. In order to do so, metaphors that were carefully rooted within local contexts while simultaneously creating new associations that aligned common existing understandings with science promoted the translation of research into policy documents. In successful translation that garnered widespread and consistent communication within policy documents over time, propitious metaphors retained the intended original scientific sense and meaning in a narratively repackaged manner.

Like previous scholars that construe translation as an active, effortful activity (e.g., Nicolini, 2010; Piekkari & Tietze, 2014; Pohl et al., 2009; Rovik, 2008; Sahlin-Andersson, 1996), my findings suggest that the construction of metaphors that are locally resonant and retain their original context can be a conscious, exigent activity. Further, similar to previous literature indicating that innovative ideas need to be translated into local languages that fulfill local purposes (Vossen & van Gestel, 2019) through stories and metaphors that are circulated in meaningful ways that resonate with local audiences (Czarniawska-Joerges, 1996; Sahlin-Andersson & Engwall, 2002; Nguyen, 2019), my analysis revealed that simplifying metaphors can facilitate successful translation. As alluded to above, this analysis supports conceptualization of translation as an effortful, rather than a passive, activity. Concerted and deliberate efforts of third-party groups can work to bring together multidisciplinary audiences in order to reshape and

realign local perspectives via carefully constructed metaphors. These efforts can re-align local understandings by creating a common language and construction of metaphors that align with extant research, and help to develop appropriate science-based decision-making that convincingly justify and put into place particular practices and activities within local contexts.

I extend the work of previous researchers that attempted to understand translation in terms of its different phases and what factors influence its development (e.g., Rovik, 2008; Czarniawska & Joerges, 1996; Lindberg & Erlingsdotter, 2005) by demonstrating a stage-like development of metaphors (Please see FIGURE 4). However, unlike Lindberg and Erlinsdotter (2005), who used the translation model proposed by Czarniawska and Joerges (1996) to describe the different phases, I related aspects of a particular setting to the translation and traced the patterns of communication involved during the process. In doing so, I found a stage-like development of metaphors during the circulation of ideas over time and across phases. Throughout the first stages of translation, the use of labels and definitions directly imported from brain and neuroscience research was relatively consistent throughout the most salient *direct* translation case, or where research is consistently communicated within policy documents. However, in the least successful *lost* case, where the topic was dropped from policy conversations and communications over time, there was variation and multiplicity in the use of terms used to refer to the existence of simultaneous mental health and addiction issues.

During the next stage of translation, definitions of terms continued to be imported directly from research into policy related to all cases, but in the less successful *lost* case, these terms and definitions maintained multiplicity and variation in their usage. For the *direct* and *scattered*

cases, the second phase saw the emergence of carefully constructed metaphors that were used to narratively communicate definitions, cause and effect relationships, and solutions to local problems. These metaphors were introduced alongside detailed narratives that were used to explain them. However, the less well translated *lost* case exhibited the use of multiple different terms to refer to the same thing, and there were no metaphors or narratives used related to this case in policy documents published during this time.

This use of metaphors was strengthened from the second to third stage of translation, whereby policy documents regularly employ terminology and metaphors derived from the neuroscience of early experiences and brain development. Often, metaphors, especially in the *direct* case, were referred to as terms and were not explained further, indicating that their meaning had become widespread and understood amongst various audiences. For example, the term ‘brain architecture’ was often used without the entire narrative that explains the relevance of building a house to building a brain via early experiences. This pattern also held in the *scattered* case, but metaphors were used more variably and less consistently in order to explain the brain science of addiction throughout policy documents. However, in the *lost* case, there continued to be multiple terms used to convey the same thing throughout the first two phases, and no metaphors or narratives are used in order to enhance understandings of concurrent addiction and mental health disorders. Eventually this research disappeared completely in policy communications.

Elements of Communication Involved in Editing Rules of Translation

I contribute to extant understandings of how the editing rules are enacted during translation processes by explicating the communicative nature of context, editing and formulation rules in relation to the findings of my analysis. Firstly, I explain how, rather than operating as distinct

and separate as some scholars contend (e.g., Wahid, 2013; Rovik, 2016; Pinheiro & Hague, 2014; Kirkpatrick et al., 2013; Teulier & Rouleau, 2013; Wust, 2017), the editing rules of translation are enacted together and simultaneously. Secondly, I show how my findings are different from extant scholarship that details how ideas must be abstracted and generalized from their original context in order to be made locally resonant (e.g., Boxenbaum & Gond, 2014; Gond & Boxenbaum, 2013; Sahlin-Andersson, 1996; Czarniawska & Joerges, 1995; Waldorff, 2013). Thirdly, I extend previous literature that reveals how that the travel of ideas involves the use of rationales that work to enroll actors during translation processes (e.g., Alcouffe et al., 2008; Bergstrom & Diedrich, 2011; Bruce & Nyland, 2011). Fourthly, I advance scholarship relating to the modified communication of ideas through alterations in language and meaning as they travel from one context into another (e.g., Boxenbaum & Strangaard Pedersen, 2009; Czarniawska & Joerges, 1996; Kardell & Wallen, 2018; Nguyen, 2019; Nicolini, 2010; Osei-Amoonsah et al., 2018; Piekkari & Tietze, 2014; Wedlin & Sahlin, 2017; Wust, 2017).

As my first contribution related to the editing rules of translation, unlike other studies suggesting that some editing rules are used in some cases while others are not, I show that the consistent and cogent use of all three editing rules throughout the translation process can promote successful translation efforts. This is important because understanding how editing rules operate is integral to the decontextualizing and recontextualizing of ideas as they travel from one context into another (Sahlin-Andersson, 1996; Sahlin & Wedlin, 1996; Wedlin & Sahlin, 2017). I build upon literature that explicates the role of the editing rules of translation by explaining how they operate in relation to each other and other elements of communication. My study suggest that the editing rules can work together and overlap, rather than existing distinctly and operating

discretely. Some scholars ascertain that the use of the types of editing rules in translation processes tends to vary depending on different settings and environments (Wahid, 2013; Rovik, 2016; Pinheiro & Hague, 2014; Kirkpatrick et al., 2013; Teulier & Rouleau, 2013; Wust, 2017). Based on my findings, I propose that, contrary to scholars such as Rovik (2016), who outlined several ways in which translators use various rules in order to perform translation and influence outcomes, and identifies conditions under which different rules are likely to apply. Instead, I find that in successful translation, all of the editing rules can be used together, rather than separately, throughout the entire process. My analysis of communicative elements expands existing literature by revealing how the different editing rules of translation can operate simultaneously in order to facilitate translation processes.

Building on theory based on the editing rules of translation, I show that context rules can be critical to making an idea travel from one context fit into a new context so that it can be rendered as locally resonant. For successful translation, this can be done using rules of logic in a variety of types of documents that consistently convey rationales of cause and effect. Additionally, such rationales, when coherently linked to local problems and appropriate, actionable solutions via activities that various local audiences can undertake can promote the travel of ideas.

I show that the manner in which these rationales are communicated can inherently entail the use of formulation rules. This can be done via the use of various labels, metaphors and narratives that are used to communicate concepts in a way that remains true to the original research for local audiences, and work to make research comprehensible and understandable for them. I show that, in successful translation, the editing rules can be simultaneously, cogently and consistently

applied in an increasingly wide array of types of communications. Further, such communications that are intended for a range of local audiences with clearly explicated goals that are clearly explained via actionable solutions for these audiences can facilitate translation.

I also build upon previous research that suggests that as an idea or practice is transferred into a new setting, aspects of it may be omitted or downplayed in its presentation as an abstraction, and stripped of the time and space bound features of its original context (Boxenbaum & Gond, 2014; Gond & Boxenbaum, 2013; Sahlin-Andersson, 1996; Czarniawska & Joerges, 1995; Waldorff, 2013). The results of my study extend such scholarship by revealing contextualization as an inherently communicative activity that renders ideas locally resonant by via use of labels and metaphors to convey rationale arguments of cause and effect and proposing actionable solutions to local problems for a broad range of audiences in a variety of formats. My analysis stands in contrast to previous conceptualizations of translation that find that in order for an idea to be brought into a new context, it must be abstracted and generalized (e.g., Czarniawska, 2004; 2009; 2010; Czarniawska & Joerges, 1996; Giddens, 1991; Sahlin-Andersson, 1996). My study suggests that too narrowly contextualizing an idea can reduce the potential for successful translation. I show that if ideas are too abstracted and generalized, they can lose their convincingness by using multiple and varied terminology or vague rationales that are not linked to actionable solutions to relevant problems.

My study suggests that losing sight of the original context can hinder translation processes, whereas maintaining aspects of the original context can facilitate translation. If an idea becomes overly abstracted in such a way that obfuscates and makes the original context obscure and

difficult for the target audience to understand, the knowledge can become *lost* or *scattered*. If research is only narrowly contextualized using multiple and varied terminology for a small range of audiences in few types of documents, and does not link to viable local solutions, it can lose its convincingness, and can become *lost* altogether. Contextualization of research that occurs through cogent and consistent cause and effect rationales that are linked to locally resonant problems and actionable solutions via consistent use of language in the form of labels, terminology and metaphors that remain true to science, can facilitate translation.

I extend previous research that suggests that, in order to be effectively translated, ideas must be construed and communicated in rationalistic terms in the form of plans of action that solve local problems, attributing them to various intentions, practices, actors and planned efforts or results of particular prescribed actions and solutions (Waldorff, 2013; Czarniawska & Joerges, 1996; Sahlin-Andersson, 1996). I find that if rationales are communicated with uncertainty, ambiguity or inconsistency, or that do not link to actionable solutions relevant to local audiences in such a way as to promote the capacity of these audiences to address locally resonant problems, translation of ideas can become *scattered* or *lost*. My findings revealed that the most successful *direct* case was characterized by highly consistent and coherent rationalizations and explanations of cause and effect and problems and solutions using labels and metaphors that were directly imported from research.

In this way, I add to scholarship that highlights the importance of enrolling actors in order to facilitate successful translation (e.g., Alcouffe et al., 2008; Bergstrom & Diedrich, 2011; Bruce & Nyland, 2011). I propose that in successful *direct* translation, clearly and consistently

communicated rationales of cause and effect relationships directly imported from research and linked to local problems associated with those relationships can facilitate translation. Further, such characteristics of arguments can become the basis for justification of clearly laid out and understandable specific, viable evidence-based activities that local audiences can undertake in order to address these local issues. In all, my study suggests that consistent communication within a variety of document types of cause and effect rationales that remain true to their original context and link clearly to local problems and actionable solutions for a broad range of audiences can promote effective translation of research into policy.

In contrast to previous work, my study suggests that translation necessitates formulation rules in the form of consistent use of labels. Other scholars have highlighted alterations made in the language used to convey ideas, and the meanings attached to them change as they travel into new contexts (e.g., Boxenbaum & Strangard Pedersen, 2009; Czarniawska & Joerges, 1996; Wallén & Kardell, 2018; Nguyen, 2019; Nicolini, 2010; Osei-Amoonsah et al., 2018; Piekkari & Tietze, 2014; Wedlin & Sahlin, 2017; Wust, 2017). Unlike Van Veen (2011), who found that TQM was translated as a new concept, MANN, in order to successfully adapt to a novel context, my analysis shows that using varying or multiple labels can hinder translation processes, resulting in *lost* translation. Further, I extend this research and demonstrate that alterations in meaning such that they no longer retain their original context can result in *scattered* translation, whereby the original idea becomes imbued with multiple meanings. In the most robust, *direct* case, I found that the consistent use of labels in a multitude of types of documents published for a wide range of audiences directly imported from their research context facilitated the translation of research into policy.

Communication Patterns Underlying Translation

My third major contribution relates to the three patterns that I identified (Please see FIGURE 3: SIMPLIFIED FIGURE OF PATTERNS OF TRANSLATION PROCESS FOR EACH CASE).

While case studies are often used in order to understand processes of translation, this is the first study to evaluate three similar, but different, research findings as they are translated into policy.

The three cases comprising this study were all based on well-regarded, peer-reviewed research with important policy implications and the setting and context were the same in all cases.

However, my analysis revealed that, despite the initial similarities between the cases, the patterns of communication about research related to each case were different, and this resulted in varying degrees of success in their translation into policy. Through analysis of policy documents that include text related to the three cases, I found that the translation of research into policy can be characterized as *direct*, *scattered* or *lost*, contingent upon the patterns of communication involved. This leads me to propose that when similar types of research are translated into policy, the process can occur in different ways. This stands in contrast to studies that suggest that the quality of research is the key factor in whether the ideas are translated into practice or not (e.g., Oliver et al., 2014). Although the quality of research is important, I suggest that other aspects of the translation process are also critical.

Overall, my findings related to the patterns of communication involved in the translation of research into policy reveal three contributions to the literature. Firstly, rather than focusing on ideas travelling from one context into different local target contexts (e.g., Ansari et al., 2010; Czarniawska & Joerges, 1996; Czarniawska & Sevón, 2005; Lounsbury, 2007; Powell et al., 2005; Sahlin & Wedlin, 2008; Sahlin-Andersson, 1996), I show that even within the same context and setting, similar ideas can go through different translation processes depending on

patterns of communication. Secondly, I advance existing literature showing that ideas and their reformulation by translators can undergo changes in form, content and meaning as they are made relevant within new settings and contexts with localized preferences and systems of beliefs (Fredriksson & Pallas, 2017; Levay & Wacks, 2009; Rovik, 2016). Thirdly, I advance scholarship explicating the role of networks and actor relationships in translation processes (Mennicken, 2008; Waldorff and Greenwood, 2011) via my analysis that shows how a third party invested group can facilitate the process of translation by perpetuating particular patterns of communication. This study reveals the progression of translation processes over time in relation to the elements of communication involved in those processes and lends insight into the intricacies of how translation occurs. I suggest that as time elapses and the translation process evolves, so too do the types of communication and the meanings attached to various research findings. My analysis helps to show how patterns of genres, audiences and the aims of policy documents can shift over time. For example, my study showed how the manner in which brain science research findings were communicated changed during their translation. In all, by attending to the elements of communication via the SPEAKING analytical tool, I was able to uncover the dynamics patterns of communication underlying the translation of research into policy.

This study builds upon previous research that portrays translation as the travel of ideas from one context into another through symbolic and narrative mechanisms (Czarniawska & Sevón, 2005; Sevón & Czarniawska, 1996). Most of the literature explicating how these symbolic and narrative mechanisms facilitate translation has emphasized the key role of gaining local acceptance by de-contextualizing ideas from their original context through abstraction and

generalization and then re-contextualizing these ideas into another context in modified, locally resonant ways (Czarniawska & Joerges, 1996; Fredriksson & Pallas, 2017; Levay & Wacks, 2009; Rovik, 2016; Wedlin & Sahlin, 2017). In contrast, rather than focusing on specific communicative mechanisms, I showed how the overall patterns of communication are important in understanding the translation of research into policy over time. Similar to the model proposed by Ocasio et al. (2015) that shows how streams of communication facilitate the emergence of institutional logics, my analysis of patterns of communication shows that collections of communicative events can enable, but also constrain processes of reproduction and change, like translation.

Additionally, in contrast to scholars who focus on the importance of local variations that arise due to the context-bound nature of translation (Ansari et al., 2010; Czarniawska & Joerges, 1996; Czarniawska & Sevón, 2005; Lounsbury, 2007; Powell et al., 2005; Sahlin & Wedlin, 2008; Sahlin-Andersson, 1996), my analysis shows that, due to different patterns of communicative elements deployed within the same local context and setting over time, similar sets of research findings can undergo different translation processes as they are brought into policy, resulting in varying degrees of success. To date, this is the first study to examine three similar, but different, translation cases within the same setting and context. Using the SPEAKING model from speech codes theory, my analysis uniquely illuminates how ideas over time are communicatively portrayed in which mediums; the audiences to whom they are conveyed with what goal; how the communication of ideas changes with the passage of time in terms of the deployment of editing rules; and how this affects the overall success of translation.

Similar to Hardy and Maguire (2010), I find that certain elements of narratives survive translation, and that ongoing translation occurs in ways that reproduce key narrative elements. The results of my study contrasts with previous literature that portrays translation as movement, and that for an idea to enter into a new context, it must be presented as an abstract model that is stripped of its original context and that actors infuse concepts with alternate meanings during their translation (Czarniawska & Joerges, 1996; Hwang & Suarez, 2005; Rottenburg, 1996; Van Veen, 2011; Waldorff, 2013). Instead, my findings suggest that, for an idea to successfully enter into and be sustained in a new context, aspects of must be retained in such a way as to directly reflect its original context.

Further, my study reveals that while certain elements of communication change over time, policy documents that used consistent language to communicate concepts that clearly retained their original meaning and remained true to the original research facilitated translation of research into policy. As Wedlin and Sahlin (2017) contend, during their translation, objects are packaged and repackaged but that even small reformulations can fundamentally alter its meaning or focus. I extend such literature by showing that translation can be more successful if research knowledge does not undergo changes in meaning throughout the different phases and when the primary focus communications about the research is consistent and stable over time. However, in less successful translation, research may not necessarily undergo major changes in meaning overtime, but if the focus of communications does, it can result in varying and multiple meanings becoming attached to research. Finally, if major reformulations of the research in terms of both its meaning and focus occur over time, it can result in knowledge becoming lost altogether.

Like previous studies, my research suggests that translation can be influenced via networks and relationships between various local and external actors (Mennicken, 2008; Waldorff & Greenwood, 2011). I advance the findings from Waldorff and Greenwood (2011) that suggest that the choice of focus during translation is influenced by relationships between local actors and the external institutional context. In my study, I found that an interested and invested third party non-governmental organization, the Alberta Family Wellness Initiative (AFWI), played an important role in the development of symposiums and conferences aiming to foster collaboration and coordination and develop a research-based common language from which later policy reports, plans and guides were produced. Effective translation may be facilitated when a contributor provides complimentary arguments in reports, routine publications like magazines, and guidelines. Such additional documents can influence policymakers, practitioners and general public audiences by providing up-to-date research and information that enhances informed, science-based local decision-making. In particular, metaphors may be effectively produced by such outside actors that allow for the construction of a common language that helps to re-align perceptions about the original concept being translated.

I conclude this chapter by summarizing the contributions arising from my study. I firstly contribute to extant literature that shows how different local contexts influence the travel of ideas. I do so by explaining the dynamic patterns of communication involved in translation processes and by demonstrating that similar ideas can undergo different processes of translation within the same context and setting. Secondly, I contribute to the translation literature by showing that ideas that remain true to their original context can be successfully translated. This stands in contrast to previous literature suggesting that ideas that must lose characteristics of

their original context in order to effectively travel. Thirdly, I suggest that a third party, outside actor can facilitate the translation process by influencing patterns of communication involved in the travel of an idea.

CHAPTER VI: CONCLUSION

The primary objective of this study was to reveal the role of communication in the translation of scientific research into policy. Based on my qualitative cross case analysis of three similar, but different, neuroscience research findings, my results suggest that successful translation entails an evolving communication process whereby ideas are translated into policy over time for broad audience consumption. In my case, ministries authored policy documents in a multitude of formats that communicated knowledge from brain science research in locally resonant ways that worked to re-align understandings with science-based explanations. This was done by connecting local problems and solutions with carefully constructed metaphors and narratives that were used to clearly and coherently justify specific activities related to diverse audiences in highly rationalistic terms that retained their scientific origins. In all, my findings show that the communication processes underlying translation can be carefully and deliberately enacted in order to reformulate and repackage ideas into more easily locally comprehended, visualized and remembered metaphors that remain true to their originating contexts and help to inform decision-making on a broad scale.

Research Summary and Reflection

Following calls for more studies aiming to understand how successful translation is done in practice (e.g., Rovik, 2016; Teulier & Rouleau, 2013), I bring communication processes into the forefront of understanding how ideas travel from one context to another. In this multiple case analysis, I employed an adapted version of Hymes' SPEAKING model (1974) in order to sensitize myself to the nuances involved with the complex communication patterns and processes involved in the translation of brain sciences into mental health and addiction policy for Alberta, Canada. This allowed me to systematically compare and contrast policy documents produced

from 1990, the start of the decade of the brain, until 2018 across several communication elements. These elements included when the documents were authored, by whom and for what audiences, what their ends were, which editing rules were used and in what ways, and the type of each of the various documents. The themes and codes from qualitative content analysis helped to contextualize the elements and bring richer understanding to the ways of communicating about new research findings as they are translated into policy documents.

My analytical and theoretical approach uniquely and explicitly conceptualizes translation as inherently communicative in nature, rather than assuming the role of communication in meaning making processes. This model helps to explicate some of the ways in which research from brain sciences has been integrated into policy over time through various effortful meaning construction activities. These activities include, but are not limited to, the effortful construction of highly locally resonant metaphors and stories that work to make brain and neuroscience more easily understood by various audiences and to guide decision-making around addiction and mental health in Alberta, Canada. Central to understanding translation is the idea that communication plays an integral role as actors translate concepts from one context, brain sciences, into another, policy, in order to influence decision-making and justify particular courses of action.

Additionally, I elucidate the previously vaguely defined and discussed editing rules of translation by providing a detailed account of how they operate and are enacted as research is translated into policy.

Boundary Conditions and Recommendations

There are several boundary conditions associated with my choice of methodology and data. My use of the SPEAKING model to analyze the translation of research findings into policy

documents from Alberta, Canada allowed me to focus on the construction of text as an important factor in knowledge translation. Further, it allowed me to reveal novel insights into the ways in which metaphors can be used as an important and robust mechanism throughout this process while also attending to the types of documents published, for who and by whom, their intended aims and the editing rules employed. However, my conclusions may be restricted to contexts located within the public sector where research ideas are set out for public use without a profit motive.

Firstly, the geographic scope of source texts; sourcing policy documents from Alberta, Canada, is one characteristic that defines the parameters and boundaries of the cases involved in this study, and limits the overall generalizeability of results. Previous research has not only found different translations of an idea between different locales (e.g., Hyndman et al., 2014; Hollerer, 2010; Czarniawska, 2011), but also within the same organization (e.g., Andersen & Rovik, 2015; Pallas, Fredriksson & Wedlin, 2016). Future research can work to further elucidate how and why the editing rules of translation are communicatively appropriated and used differently in different geographical locations defined by distinct histories, perceptions and cultural norms, but also what aspects of these implicit rules of translation remain constant under diverging geographical and cultural conditions.

In another vein, the type of information, stemming from brain and neurosciences research findings related to addiction and mental health, that is translated within this study may undergo certain communication patterns that may or may not be similar to those undertaken when attempting to circulate different types of knowledge. Scholars have ascertained that the

translation of particular types of concepts undergo different processes of circulation (Sahlin-Andersson & Engwall, 2002; Djelic & Sahlin-Andersson, 2006a). However, little is known about how the nature of an idea itself plays out in translation. For instance, ideas involving morality or ethics could undergo very different communication patterns as they are circulated when compared to science-based explanations and concepts. Thus, researchers could also improve understanding of the operation of editing rules by studying how various forms and types of ideas and knowledge are circulated.

My analysis suggests that a third-party, outside group influenced patterns of communication and effectively facilitated successful translation. While outside the scope of my study, the role of side groups, like non-governmental organizations, and the concerted coordination of conferences and symposiums that brought together multi-disciplinary groups was suggested to play a significant role in the successful circulation of science-based explanations of addiction and mental health. Third parties such as these are worthy of scholarly discussion in and of themselves, as they can exert efforts to either facilitate or constrain particular ways of meaning construction that influence the travel of ideas in various ways. Understanding the role of collaborative and coordinating stakeholders in the translation processes and how and why they influence the communication of ideas and their uptake by particular audiences, is a viable avenue for prospective empirical research. Likewise, this study, like others (e.g., Kirkpatrick et al., 2013; Nicolini, 2010; Zilber, 2006), suggests that powerful actors can influence processes of translation. In the context of this study, translation was facilitated by an interested and invested third party organization that was dedicated to aligning current research with decision-making. Alternatively, in other contexts, a third party could have other, divergent interests and could

work to distort or interrupt translation. Future research could investigate other outside intervening groups that challenge and work to change translation efforts.

While my study suggests that particular events, such as conferences and symposiums were put together by outside groups in order to facilitate translation of research into policy, my data and scope of analysis did not allow me to delve deeply into their construction. Field configuring events are “temporary social organizations”, like conferences and symposiums, that bring together diverse groups of organizational fields to exchange information and coordinate activities (Lampel & Meyer, 2008). As discussed above, this study suggests that there may be an important role of outside actors who contribute to patterns of communication underlying translation. Importantly, such outside actors may facilitate the planning of field configuring events, or multidisciplinary translation spaces (e.g., Zilber, 2006; Teulier & Rouleau, 2013), like conferences and symposiums, wherein multidisciplinary groups can come together in an effort to construct meaning and re-align existing perceptions. This raises interesting questions about the nature of these types of spaces, how they are coordinated and how multidisciplinary groups collaboratively construct and reconstruct meanings around concepts and ideas in order to facilitate their circulation within novel contexts. Researchers contend that, at the interorganizational level, various translation spaces are formed that allow for and facilitate particular models of interpretation (Zilber, 2006; Teulier & Rouleau, 2013). In order to more completely understand how these spaces are formed and how processes of translation are facilitated by them, future research could attend to the communication processes by which this is accomplished. One avenue for scholars to pursue would be to employ the SPEAKING model to analyze and compare these spaces and the activities that occur within them in an effort to

understand and fruitfully explore the situated, cultural dynamics of communicative meaning construction processes as a common language and understandings emerge within them.

While much of the translation literature has focused on the end results of translation and implicitly includes considerations of communication, I explicitly examine the role of communication in the translation of novel scientific research findings into policy. Thereby, I provide important insights regarding how translation operates and shed light upon the rules that facilitate the travel of ideas from one context into another. The findings of this study make three primary contributions to translation theory. Firstly, I find that metaphors can be an important communicative mechanism of translation. However, in order for effective construction and communication of metaphors that both appeal to local audiences and remain true to their original contexts, they must be carefully and consistently employed in a variety of types of communication for consumption by widespread and various audiences. Secondly, I explicate the nature of editing rules, and how they can operate in relation to one another, and as part of translation more generally. While there has been a great deal of emphasis on the rule bound nature of translation processes, I contribute to the literature by more fully explicating these rules and how they are employed during the travel of ideas over time. Thirdly, I provide a more nuanced explication of the general communication patterns underlying translation processes. To date, scholars have tended to overlook or gloss over the role of communication, or only emphasize particular aspects of communication, in the circulation of ideas between contexts. In this study, I provide a deep and descriptive explanation of longitudinal and ongoing communication patterns underlying the translation of innovative research into policy. Overall, this study suggests that successful translation requires competent actors who can skillfully enact

editing rules and effectively communicate new knowledge and translate ideas from one context into another in such a way as to adequately represent their meanings from their original context.

I greatly applaud and appreciate the tremendous amount of effort and obvious care that policymakers put into implementing policy that is both relevant and effective on an ongoing basis. The world around us is constantly changing, new knowledge is always emerging, and novel societal concerns are continuously developing. The ability and competence of policymakers to provide well-crafted arguments designed to convince key audiences to change while retaining their societal relevance is truly admirable. I am thankful for the ability to engage in this research and that I was able to examine policy documents published over decades. As both an educator and a researcher myself, I understand the demands placed upon policymakers to incorporate innovative ideas into actionable policies that address important issues and improve society in meaningful ways. I hope that research on translation can help to facilitate the effective travel of ideas from various contexts into policy.

REFERENCES

- Abrahamson, E., & Rosenkopf, L. (1997). Social network effects on the extent of idea diffusion: A computer simulation. *Organization science*, 8(3), 289-309.
- Alexander, P. A., & Jetton, T. L. (2003). Learning from traditional and alternative texts: New conceptualizations for the information age. *Handbook of discourse processes*, 199-241.
- Alcouffe, S., Berland, N., & Levant, Y. (2008). Actor-networks and the diffusion of management accounting ideas: A comparative study. *Management Accounting Research*, 19(1), 1-17.
- Akrich, Madeleine, et al. "The key to success in innovation part I: the art of interessement." *International journal of innovation management* 6.02 (2002): 187-206.
- AMHSCN (2014). Alberta Addiction and Mental Health Information and Services (<http://www.health.alberta.ca/health-info/addiction-mental-health.html>) (retrieved January, 2016).
- Andersen, H., & Røvik, K. A. (2015). Lost in translation: A case-study of the travel of lean thinking in a hospital. *BMC health services research*, 15(1), 401.
- Ansari, S. M., Fiss, P. C., & Zajac, E. J. (2010). Made to fit: How practices vary as they diffuse. *Academy of Management Review*, 35(1), 67-92.
- Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative research*, 1(3), 385-405.
- Bail, C. A. (2012). The fringe effect civil society organizations and the evolution of media discourse about Islam since the September 11th attacks. *American Sociological Review*, 77(6), 855-879.
- Bakhtin, M. M. (1935). Discourse in the novel. *The Novel: An Anthology of Criticism And Theory 1900–2000*, 481-510.
- Bakhtin, M. (1971). Discourse typology in prose. *Readings in Russian poetics: Formalist and structuralist views*, 176-96.
- Bakhtin, M. M. (1981). The dialogic imagination: Four essays by MM Bakhtin (M. Holquist, Ed.; C. Emerson & M. Holquist, Trans.).
- Barthes, R. (1997). *The Eiffel Tower, and other mythologies*. Univ of California Press.
- Barthes, Roland. "Mythologies: The complete edition." NY: Hill and Wang (2013).
- Bateson, G. (1972). The logical categories of learning and communication. *Steps to an Ecology of Mind*, 279-308.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report*, 13(4), 544-559.
- Becker-Ritterspach, F., Saka-Helmhout, A., & Hotho, J. J. (2010). Learning in multinational enterprises as the socially embedded translation of practices. *Critical Perspectives on International Business*.
- Benner, M. J., & Tripsas, M. (2012). The influence of prior industry affiliation on framing in nascent industries: The evolution of digital cameras. *Strategic Management Journal*, 33(3), 277-302.
- Berger, P., & Luckmann, T. (1967). *The social construction of reality: A treatise on the sociology of education*.
- Bergström, O., & Diedrich, A. (2011). Exercising social responsibility in downsizing: Enrolling and mobilizing actors at a Swedish high-tech company. *Organization Studies*, 32(7), 897-919.

- Bernstein, B. (1971). *Class, Codes and Control: Theoretical Studies Towards a Sociology of Language*. London: Routledge & Kegan Paul.
- Bernstein, B. (1977). *Class, Codes and Control*, Vol. III, second (revised) edition.
- Bernstein, B. (1981). Codes, modalities, and the process of cultural reproduction: A model. *Language in society*, 10(03), 327-363.
- Bernstein, B. (2003). *Class, codes and control: Applied studies towards a sociology of language* (Vol. 2). Psychology Press.
- Blommaert, J., & Backus, A. (2013). Superdiverse repertoires and the individual. In *Multilingualism and multimodality* (pp. 9-32). Brill Sense.
- Boxenbaum, E., & Gond, J. P. (2013). Micro-strategies of contextualization: Glocalizing responsible investment in France and Quebec. In *Global themes and local variations in organization and management* (pp. 327-340). Routledge.
- Boxenbaum, E., & Jonsson, S. (2008). Isomorphism, diffusion and decoupling. *The Sage handbook of organizational institutionalism*, 78-98.
- Boxenbaum, E., & Pederson, J. S. (2009). Institutional Work. *Institutional work: Actors and agency in institutional studies of organizations*, 178.
- Bruce, K., & Nyland, C. (2011). Elton Mayo and the deification of human relations. *Organization studies*, 32(3), 383-405.
- Brunsson, N., & Sahlin-Andersson, K. (2000). Constructing organizations: The example of public sector reform. *Organization studies*, 21(4), 721-746.
- Bryman, A. (2004). *Encyclopedia of Social Science Research Methods*.
- Burt, R. S. (1997). A note on social capital and network content. *Social networks*, 19(4), 355-373.
- Callon, M., & Latour, B. (1981). Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so. *Advances in social theory and methodology: Toward an integration of micro-and macro-sociologies*, 277-303.
- Carbaugh, D. (2007). Cultural discourse analysis: Communication practices and intercultural encounters. *Journal of intercultural communication research*, 36(3), 167-182.
- Chua, W. F. (1995). Experts, networks and inscriptions in the fabrication of accounting images: a story of the representation of three public hospitals. *Accounting, organizations and Society*, 20(2-3), 111-145.
- Christensen, L. T., & Cornelissen, J. (2015). Organizational transparency as myth and metaphor. *European Journal of Social Theory*, 18(2), 132-149.
- Cooren, F. (2006). The organizational world as a plenum of agencies. Communication as organizing: Empirical and theoretical explorations in the dynamic of text and conversation, 81-100.
- Cornelissen, J. P. (2005). Beyond compare: Metaphor in organization theory. *Academy of Management Review*, 30(4), 751-764.
- Cornelissen, J. P., Durand, R., Fiss, P. C., Lammers, J. C., & Vaara, E. (2015). Putting communication front and center in institutional theory and analysis.
- Cornelissen, J. P., Holt, R., & Zundel, M. (2011). The role of analogy and metaphor in the framing and legitimization of strategic change. *Organization Studies*, 32(12), 1701-1716.
- Cornelissen, J. P., Oswick, C., Thøger Christensen, L., & Phillips, N. (2008). Metaphor in organizational research: Context, modalities and implications for research—Introduction. *Organization Studies*, 29(1), 7-22.

- Corvellec, H., & Eriksson-Zetterquist, U. (2016). Barbara Czarniawska. Organizational change: fashions, institutions, and translations. *The Palgrave Handbook of Organizational Change Thinkers, Palgrave Macmillan, Cham*, 1-16.
- Creed, W. D., Scully, M. A., & Austin, J. R. (2002). Clothes make the person? The tailoring of legitimating accounts and the social construction of identity. *Organization science, 13*(5), 475-496.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.
- Cunliffe, A. L. (2001). Managers as practical authors: Reconstructing our understanding of management practice. *Journal of management studies, 38*(3), 351-371.
- Czarniawska, B. (2004). On time, space, and action nets. *Organization, 11*(6), 773-791.
- Czarniawska, B. (2009). Emerging institutions: pyramids or anthills? *Organization Studies, 30*(4), 423-441.
- Czarniawska, B. (2010). Translation impossible? Accounting for a city project. *Accounting, auditing & accountability journal*.
- Czarniawska, B. (2012). Operational risk, translation, and globalization. *Contemporary Economics, 6*(2), 26-39.
- Czarniawska, B., & Sevón, G. (Eds.). (1996). *Translating organizational change* (Vol. 56). Walter de Gruyter. Chicago.
- Czarniawska, B., & Joerges, B. (1996). Travels of ideas. *Translating organizational change*.
- Czarniawska-Joerges, B., & Sevón, G. (Eds.). (2005). *Global ideas: How ideas, objects and practices travel in a global economy* (Vol. 13). Copenhagen Business School Press.
- Damanpour, F. (1991). Organizational idea: A meta-analysis of effects of determinants and moderators. *Academy of management journal, 34*(3), 555-590.
- Damanpour, F., Walker, R. M., & Avellaneda, C. N. (2009). Combinative effects of innovation types and organizational performance: A longitudinal study of service organizations. *Journal of management studies, 46*(4), 650-675.
- Davis, G. F. (1991). Agents without principles? The spread of the poison pill through the intercorporate network. *Administrative science quarterly, 583-613*.
- Denis, D. J., Denis, D. K., & Sarin, A. (1999). Agency theory and the influence of equity ownership structure on corporate diversification strategies. *Strategic Management Journal, 1071-1076*.
- Denzin, N. K., & Lincoln, Y. (2000). Qualitative research. *Thousand Oaks ua*, 413-427.
- DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Collective rationality and institutional isomorphism in organizational fields. *American Sociological Review, 48*(2), 147-160.
- DiMaggio, P. J., & Powell, W. W. (Eds.). (1991). *The new institutionalism in organizational analysis* (Vol. 17). Chicago, IL: University of Chicago Press.
- Djelic, M. L. (2008). Sociological studies of diffusion: is history relevant?. *Socio-Economic Review, 6*(3), 538-557.
- Djelic, M. L., & Sahlin-Andersson, K. (Eds.). (2006). *Transnational governance: Institutional dynamics of regulation*. Cambridge University Press.
- Djelic, M. L., & Sahlin, K. (2009). Governance and its transnational dynamics: Towards a reordering of our world. *Accounting, Organizations & Institutions: Essays in Honour of Anthony Hopwood, 175-204*.
- Drisko, J., & Maschi, T. (2015). *Content analysis*. Oxford University Press.

- Edelman, L. B. (1992). Legal ambiguity and symbolic structures: Organizational mediation of civil rights law. *American journal of Sociology*, 1531-1576.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management review*, 14(4), 532-550.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, 50(1), 25-32.
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis. *Sage Open*, 4(1).
- Eriksson-Zetterquist, U., Lindberg, K., & Styhre, A. (2009). When the good times are over: Professionals encountering new technology. *Human relations*, 62(8), 1145-1170.
- Erlanson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods*. Sage.
- Erlingsdóttir, G., & Lindberg, K. (2005). *Isomorphism, Isopraxism and Isonymism- Complementary or Competing Processes?* (No. 2005/4).
- Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research*. Psychology Press.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, 14(4), 245-258.
- Ferlie, E., Fitzgerald, L., Wood, M., & Hawkins, C. (2005). The nonspread of ideas: the mediating role of professionals. *Academy of management journal*, 48(1), 117-134.
- Fiss, P. C., & Zajac, E. J. (2006). The symbolic management of strategic change: Sensegiving via framing and decoupling. *Academy of Management Journal*, 49(6), 1173-1193.
- Fiss, P., & Kennedy, M. (2008). Of pork bellies and professions: Market framing and the creation of online advertising exchange. *Unpublished manuscript*. Los Angeles: Marshall School of Business, University of Southern California.
- Fligstein, N. (1985). The spread of the multidivisional form among large firms, 1919-1979. *Advances in Strategic Management*, 17, 55-78.
- Foley, J. M. (1995). *The singer of tales in performance*. Indiana University Press.
- Fornara, N., Viganò, F., & Colombetti, M. (2004). Agent communication and institutional reality. In *International Workshop on Agent Communication* (pp. 1-17). Springer, Berlin, Heidelberg.
- Fornara, N., Viganò, F., & Colombetti, M. (2007). Agent communication and artificial institutions. *Autonomous Agents and Multi-Agent Systems*, 14(2), 121-142.
- Fredriksson, M., Olsson, E.K., and Pallas, J. (2014). Creativity caged in translation: a neo-institutional perspective on crisis communication.
- Fredriksson, J., Enqvist, O., & Kahl, F. (2014). Fast and reliable two-view translation estimation. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* (pp. 1606-1612).
- Fredriksson, M., & Pallas, J. (2016). Diverging principles for strategic communication in government agencies. *International Journal of Strategic Communication*, 10(3), 153-164.
- Fredriksson, M., & Pallas, J. (2017). The localities of mediatization: How organizations translate mediatization into everyday practices. In *Dynamics of mediatization* (pp. 119-136). Palgrave Macmillan, Cham.
- Gabriel, Y. (2004). Narratives, stories and texts. *The Sage handbook of organizational discourse*,

- 61, 77.
- Gergen, K. J., & Thatchenkery, T. J. (1996). Organization Science as Social. *Journal of Applied Behavioral Science*, 32(4), 356-377.
- Gergen, K. J., & Thatchenkery, T. J. (1996). Developing dialogue for discerning differences. *The Journal of applied behavioral science*, 32(4), 428-433.
- Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*. Stanford university press.
- Giddens, A., Duneier, M., Appelbaum, R. P., & Carr, D. S. (1991). *Introduction to sociology*. New York: Norton.
- Glaser, B., & Strauss, A. (1967). The discovery of grounded theory. *London: Weidenfeld and Nicholson*, 24(25), 288-304.
- Golden-Biddle, K., Reay, T., Petz, S., Witt, C., Casebeer, A., Pablo, A., & Hinings, C. R. (2003). Toward a communicative perspective of collaborating in research: the case of the researcher-decision-maker partnership. *Journal of Health Services Research & Policy*, 8(2), 20-25.
- Gond, J. P., & Boxenbaum, E. (2013). The glocalization of responsible investment: Contextualization work in France and Quebec. *Journal of business ethics*, 115(4), 707-721.
- Gondo, M. B., & Amis, J. M. (2013). Variations in practice adoption: The roles of conscious reflection and discourse. *Academy of Management Review*, 38(2), 229-247.
- Gondo, M. B., Amis, J. M., Janz, B., & Vardaman, J. M. (2013). The Paradox of Fit: How Perceptions of Fit Impede Organizational Change. In *Academy of Management Proceedings* (Vol. 2013, No. 1, p. 16848). Briarcliff Manor, NY 10510: Academy of Management.
- Greenwood, R., & Hinings, C. R. (1996). Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of management review*, 21(4), 1022-1054.
- Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). Theorizing change: The role of professional associations in the transformation of institutionalized fields. *Academy of management journal*, 45(1), 58-80.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field methods*, 18(1), 59-82.
- Guler, I., Guillén, M. F., & Macpherson, J. M. (2002). Global competition, institutions, and the diffusion of organizational practices: The international spread of ISO 9000 quality certificates. *Administrative science quarterly*, 47(2),
- Gustafsson, J. (2017). Single case studies vs. multiple case studies: A comparative study.
- Gumperz, J. J., & Hymes, D. H. (Eds.). (1986). *Directions in sociolinguistics: The ethnography of communication*. Oxford: Basil Blackwell.
- Gumperz, J. J., & Levinson, S. C. (1991). Rethinking linguistic relativity. *Current Anthropology*, 32(5), 613-623.
- Halliday, M. A. K. (1976). Anti-Languages. *American Anthropologist*, 78(3), 570-584.
- Halliday, M. A. K. (1978). *Language as social semiotic* (p. 136). Arnold: London.
- Hampel, C. E., Lawrence, T. B., & Tracey, P. (2017). Institutional work: Taking stock and making it matter. *The Sage handbook of organizational institutionalism*, 558-590.
- Hardy, C., & Maguire, S. (2010). Discourse, field-configuring events, and change in organizations and institutional fields: Narratives of DDT and the Stockholm Convention.

- Academy of Management Journal*, 53(6), 1365-1392.
- Hargadon, A. B., & Douglas, Y. (2001). When ideas meet institutions: Edison and the design of the electric light. *Administrative science quarterly*, 46(3), 476-501.
- Heracleous, L., & Marshak, R. J. (2004). Conceptualizing organizational discourse as situated symbolic action. *Human relations*, 57(10), 1285-1312.
- Heritage, J. 2004. Conversation Analysis and Institutional Talk. In Robert Sanders and Kristine Fitch (eds), *Handbook of Language and Social Interaction*. Mahwah NJ, Erlbaum: 103-146
- Hill, M. R. (1993). *Archival strategies and techniques* (Vol. 31). Sage Publications.
- Hinings, C. R., Casebeer, A., Reay, T., Golden-Biddle, K., Pablo, A., & Greenwood, R. (2003). Regionalizing healthcare in Alberta: legislated change, uncertainty and loose coupling. *British Journal of Management*, 14(s1), S15-S30.
- Hodder, I. (2003). The interpretation of documents and material culture. *Collecting and interpreting qualitative materials*, 2, 155-175.
- Hoffman, A. J., & Ocasio, W. (2001). Not all events are attended equally: Toward a middle-range theory of industry attention to external events. *Organization science*, 12(4), 414-434.
- Höllerer, M. A., Walgenbach, P., & Drori, G. S. (2017). The consequences of globalization for institutions and organizations. *The SAGE handbook of organizational institutionalism*, 214-242.
- Holquist, M. (2002). *Dialogism: Bakhtin and his world*. Psychology Press.
- Hwang, H., & Suarez, D. (2005). *Lost and found in the translation of strategic plans and Websites*.
- Hymes, D. (1964). Introduction: Toward Ethnographies of Communication 1. *American anthropologist*, 66(6_PART2), 1-34.
- Hymes, D. (1972). "On communicative competence." *sociolinguistics* (1972): 269-293.
- Hymes, D. (1974). Ways of speaking. *Explorations in the ethnography of speaking*, 1, 433-451.
- Hymes, D. (2003). *Foundations in sociolinguistics: An ethnographic approach*. Psychology Press.
- Hymes, D. (2005). Models of the interaction of language and social life: Toward a descriptive theory. *Intercultural discourse and communication: The essential readings*, 4-16.
- Hymes, D. H. (2012). *The ethnography of speaking* (pp. 99-138). De Gruyter Mouton.
- Hyndman, N., Liguori, M., Meyer, R. E., Polzer, T., Rota, S., & Seiwald, J. (2014). The translation and sedimentation of accounting reforms. A comparison of the UK, Austrian and Italian experiences. *Critical Perspectives on Accounting*, 25(4-5), 388-408.
- Jakobson, R. (1960). Linguistics and poetics. In *Style in language* (pp. 350-377). MA: MIT Press.
- Johnson, B., & Hagström, B. (2005). The translation perspective as an alternative to the policy diffusion paradigm: The case of the Swedish methadone maintenance treatment. *Journal of Social Policy*, 34(3), 365-388.
- Kalou, Z., & Sadler-Smith, E. (2015). Using ethnography of communication in organizational research. *Organizational Research Methods*, 18(4), 629-655.
- Keating, E. (2001). *The ethnography of communication* (pp. 285-301). na.
- Kindmark, P., & Thunberg, E. (2018). To lead or to follow: Translating innovative technologies as a result of industrial fashion.

- Kirkpatrick, I., Bullinger, B., Lega, F., & Dent, M. (2013). The translation of hospital management models in European health systems: a framework for comparison. *British Journal of Management*, 24(S1), S48-S61.
- Kjeldsen, A. K. (2013). Strategic communication institutionalized: A Scandinavian perspective. *Public Relations Inquiry*, 2(2), 223-242.
- Kohlbacher, F. (2006). The use of qualitative content analysis in case study research. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 7, No. 1, pp. 1-30). Institut für Qualitative Forschung.
- Koob, G. F., & Moal, M. L. (1997). Drug abuse: hedonic homeostatic dysregulation. *Science*, 278(5335), 52-58.
- Koob, G. F., Sanna, P. P., & Bloom, F. E. (1998). Neuroscience of addiction. *Neuron*, 21(3), 467-476.
- Kosten, T. R., Markou, A., & Koob, G. F. (1998). Depression and stimulant dependence: neurobiology and pharmacotherapy. *The Journal of nervous and mental disease*, 186(12), 737-745.
- Kraatz, M. S., & Zajac, E. J. (1996). Exploring the limits of the new institutionalism: The causes and consequences of illegitimate organizational change. *American Sociological Review*, 812-836.
- Krippendorff, K. (1980). *Content Analysis: An Introduction to Its Methodology*. Sage Publications, Beverly Hills.
- Krippendorff, K. (2012). *Content analysis: An introduction to its methodology*. Sage.
- Kristeva, J. (1985). Intertextuality and literary interpretation. *Julia Kristeva Interviews*, 188-203.
- Labuschagne, A. (2003). Qualitative research: Airy fairy or fundamental. *The qualitative report*, 8(1), 100-103.
- Laffey, M., & Weldes, J. (2004). Methodological reflections on discourse analysis. *Qualitative Methods*, 2(1), 28-31.
- Lakoff, G., & Johnson, M. (2003). *Metaphors we live by*. 1980. Chicago: U Of Chicago P.
- Lamb, P., & Currie, G. (2012). Eclipsing adaptation: The translation of the US MBA model in China. *Management Learning*, 43(2), 217-230.
- Lampel, J., & Meyer, A. D. (2008). Field-Configuring Events as Structuring Mechanisms: How Conferences, Ceremonies, and Trade Shows Constitute New Technologies, Industries, and Marketsguest Editors Introduction. *Journal of Management Studies*, 45(6), 1025-1035.
- Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Harvard University Press.
- Lawrence, T. B., & Phillips, N. (2004). From Moby Dick to Free Willy: Macro-cultural discourse and institutional entrepreneurship in emerging institutional fields. *Organization*, 11(5), 689-711.
- Lawrence, T. B., & Suddaby, R. (2006). 1.6 institutions and institutional work. *The SAGE Handbook of Organization Studies*, 215.
- Lebaron, F. (2009). How Bourdieu “quantified” Bourdieu: The geometric modelling of data. In *Quantifying Theory: Pierre Bourdieu* (pp. 11-29). Springer Netherlands.
- Leblebici, H., Salancik, G. R., Copay, A., & King, T. (1991). Institutional change and the transformation of interorganizational fields: An organizational history of the US radio broadcasting industry. *Administrative science quarterly*, 333-363.
- Levy, C. & Waks, C. (2009). Professions and the pursuit of transparency in

- healthcare: two cases of soft autonomy. *Organization Studies*, 30(5), 509-527.
- Levi-Faur, D. (2005). The global diffusion of regulatory capitalism. *The annals of the American academy of political and social science*, 598(1), 12-32.
- Loewenstein, J. (2014). Take my word for it: How professional vocabularies foster organizing. *Journal of Professions and Organization*.
- Lounsbury, M. (2007). A tale of two cities: Competing logics and practice variation in the professionalizing of mutual funds. *Academy of management journal*, 50(2), 289-307.
- Lounsbury, M., & Crumley, E. T. (2007). New practice creation: An institutional perspective on idea. *Organization studies*, 28(7), 993-1012.
- Lounsbury, M., & Glynn, M. A. (2001). Cultural entrepreneurship: Stories, legitimacy, and the acquisition of resources. *Strategic management journal*, 22(6-7), 545-564.
- Maguire, S., & Hardy, C. (2009). Discourse and deinstitutionalization: The decline of DDT. *Academy of management journal*, 52(1), 148-178.
- Mair, J., Wolf, M., & Seelos, C. (2016). Scaffolding: A process of transforming patterns of inequality in small-scale societies. *Academy of Management Journal*, 59(6), 2021-2044.
- Malets, O., & Zajak, S. (2014). Moving Culture: Transnational Social Movement Organizations as Translators in a Diffusion Cycle. In *Conceptualizing culture in social movement research* (pp. 251-274). Palgrave Macmillan UK.
- Markou, A., Kosten, T. R., & Koob, G. F. (1998). Neurobiological similarities in depression and drug dependence: a self-medication hypothesis. *Neuropsychopharmacology*, 18(3), 135-174.
- Marquis, C. (2003). The pressure of the past: Network imprinting in intercorporate communities. *Administrative Science Quarterly*, 48(4), 655-689.
- Mayring, P. (2000). Qualitative content analysis. *Qualitative Sozialforschung*. In *Forum: Qualitative Social Research* (Vol. 1, No. 2).
- Mayring, P. (2014). Qualitative content analysis: theoretical foundation, basic procedures and software solution.
- Mennicken, A. (2008). Connecting worlds: The translation of international auditing standards into post-Soviet audit practice. *Accounting, Organizations and Society*, 33(4), 384-414.
- Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. Jossey-Bass.
- Meyer, J. W. (1996). Otherhood: The promulgation and transmission of ideas in the modern organizational environment. *Translating organizational change*, 241-252.
- Meyer, R. E., & Höllerer, M. A. (2010). Meaning structures in a contested issue field: A topographic map of shareholder value in Austria. *Academy of Management Journal*, 53(6), 1241-1262.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, 340-363.
- Meyer, J. W., Rowan, B., Powell, W. W., & DiMaggio, P. J. (1991). The new institutionalism in organizational analysis. *The new institutionalism in organizational analysis*.
- MHAPP (2004). Parliament of Canada Mental Health, Mental Illness and Addiction: Overview of Policies Programs in Canada. (Retrieved January, 2016).
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.
- Mills, C. W. (1939). Language, logic, and culture. *American Sociological Review*, 4(5), 670-680.
- Montgomery, M. (2013). *An introduction to language and society*. Routledge.
- organ, G. (1986). *Images of organization* (1st ed.). Thousand Oaks, CA: SAGE.

- Morris, T., & Lancaster, Z. (2006). Translating management ideas. *Organization Studies*, 27(2), 207-233.
- Myers, G. (1992). 'In this paper we report...': Speech acts and scientific facts. *Journal of Pragmatics*, 17(4), 295-313.
- Navis, C., & Glynn, M. A. (2010). How new market categories emerge: Temporal dynamics of legitimacy, identity, and entrepreneurship in satellite radio, 1990–2005. *Administrative Science Quarterly*, 55(3), 439-471.
- Nicolini, D. (2010). Medical innovation as a process of translation: A case from the field of telemedicine. *British Journal of Management*, 21(4), 1011-1026.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, 5(1), 14-37.
- Nonaka, I., Byosiere, P., Borucki, C. C., & Konno, N. (1994). Organizational knowledge creation theory: A first comprehensive test. *International Business Review*, 3(4), 337-351.
- Nordell, E. (2013). The Ambiguity of Idea Bearers-A Study of a Translation Process within the Swedish Health Care System.
- Ocasio, W., Loewenstein, J., Nigam, A. (2015). How streams of communication reproduce and change institutional logics: The role of categories. *Academy of Management Review*, 40: 28-48.
- Oliver, K., Innvar, S., Lorenc, T., Woodman, J., & Thomas, J. (2014). A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC health services research*, 14(1), 1-12.
- Orbe, M. P. (1998). *Constructing co-cultural theory: An explication of culture, power, and communication*. Sage.
- Orlikowski, W. J., & Barley, S. R. (2001). Technology and institutions: What can research on information technology and research on organizations learn from each other?. *MIS quarterly*, 145-165.
- Ouchi, W. G. (1981). The Z organization. *Classics of Organization Theory*, 451-460.
- Outila, V., Piekkari, R., Mihailova, I., & Angouri, J. (2021). "Trust But Verify": How middle managers in a multinational use proverbs to translate an imported management concept. *Organization Studies*, 42(10), 1581-1601.
- Øygarden, O., & Mikkelsen, A. (2020). Readiness for change and good translations. *Journal of Change Management*, 20(3), 220-246.
- Øygarden, O., Olsen, E., & Mikkelsen, A. (2020). Changing to improve? Organizational change and change-oriented leadership in hospitals. *Journal of Health Organization and Management*.
- Özen, Ş., & Berkman, Ü. (2007). Cross-national reconstruction of managerial practices: TQM in Turkey. *Organization Studies*, 28(6), 825-851.
- Pallas, J., Fredriksson, M., & Olsson, E. K. (2014). Creativity Caged in Translation: A Neo-Institutional Perspective on Crisis Communication. *Revista Académica de Relaciones Internacionales*.
- Pallas, J., Fredriksson, M., & Wedlin, L. (2016). Translating institutional logics: When the media logic meets professions. *Organization studies*, 37(11), 1661-1684.
- Parker, L. (2004). *Qualitative research* (pp. 169-187). Routledge.
- Patton, M.Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

- Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative social work, 1*(3), 261-283.
- Penfield, J., & Duru, M. (1988). Proverbs: Metaphors that teach. *Anthropological quarterly, 119*-128.
- Phillips, N., & Brown, J. L. (1993). Analyzing communication in and around organizations: A critical hermeneutic approach. *Academy of Management journal, 36*(6), 1547-1576.
- Phillips, N., Lawrence, T. B., & Hardy, C. (2004). Discourse and institutions. *Academy of management review, 29*(4), 635-652.
- Philipsen, G. (1997). A theory of speech codes. *Developing communication theories, 6*.
- Philipsen, G. (1992). *Speaking culturally: Explorations in social communication*. SUNY Press.
- Philipsen, G., Coutu, L. M., & Covarrubias, P. (2005). Speech codes theory. *Theorizing about intercultural communication, 55*-68.
- Philipsen, G., & Hart, T. (2015). Speech codes theory. *The International Encyclopedia of Language and Social Interaction, 1*-13.
- Phillips, N., Lawrence, T. B., & Hardy, C. (2004). Discourse and institutions. *Academy of management review, 29*(4), 635-652.
- Piekkari, R., & Tietze, S. (2014). Micropolitical behavior in the multinational enterprise: A language perspective. In *Multinational enterprises, markets and institutional diversity*. Emerald Group Publishing Limited.
- Piekkari, R., Tietze, S., & Koskinen, K. (2020). Metaphorical and interlingual translation in moving organizational practices across languages. *Organization Studies, 41*(9), 1311-1332.
- Pratt, M. G., & Kraatz, M. S. (2009). E pluribus unum: Multiple identities and the organizational self. *Exploring positive identities and organizations: Building a theoretical and research foundation, 385*-410.
- Quinn, R. W., & Dutton, J. E. (2005). Coordination as energy-in-conversation. *Academy of management review, 30*(1), 36-57.
- Rao, H., & Giorgi, S. (2006). Code breaking: How entrepreneurs exploit cultural logics to generate institutional change. *Research in organizational behavior, 27*, 269-304.
- Rao, H., Monin, P., & Durand, R. (2003). Institutional change in Toque Ville: Nouvelle cuisine as an identity movement in French gastronomy¹. *American journal of sociology, 108*(4), 795-843.
- Reay, T., Goodrick, E., Casebeer, A., & Hinings, C. B. (2013). Legitimizing new practices in primary health care. *Health care management review, 38*(1), 9-19.
- Reay, T., & Hinings, C. B. (2005). The recomposition of an organizational field: Health care in Alberta. *Organization studies, 26*(3), 351-384.
- Reay, T., & Hinings, C. R. (2009). Managing the rivalry of competing institutional logics. *Organization studies, 30*(6), 629-652.
- Rogers, E. (1983). M. (1983). Diffusion of ideas. *New York*.
- Rogers, E. M. (1995). Diffusion of Ideas: modifications of a model for telecommunications. In *Die diffusion von ideaen in der telekommunikation* (pp. 25-38). Springer, Berlin, Heidelberg.
- Rogers, E. M. (2003). Diffusion of ideas (5th ed.). New York, NY: Free Press.
- Roggeband, C. (2007). Translators and transformers: International inspiration and exchange in social movements. *Social Movement Studies, 6*(3), 245-259.

- Rosa, J. A., Porac, J. F., Runser-Spanjol, J., & Saxon, M. S. (1999). Sociocognitive dynamics in a product market. *Journal of marketing*, 63(4_suppl1), 64-77.
- Rottenburg, R. (1996). When Organization Travels: On Intercultural Translation. S. 191–240 in: B. Czarniawska-Joerges & G. Sevón (Hrsg.), *Translating Organizational Change*.
- Røvik, K. A. (2002). The secrets of the winners: Management ideas that flow. In K. Sahlin & L. Engwall (Eds.), *The expansion of management knowledge. Carriers, flows, and sources*. Stanford: Stanford Business Books.
- Røvik, K. A. (2011). From fashion to virus: An alternative theory of organizations' handling of management ideas. *Organization Studies*, 32, 631—653.
- Røvik, K. A. (2016). Knowledge transfer as translation: Review and elements of an instrumental theory. *International Journal of Management Reviews*, 18(3), 290-310.
- Ruef, M., & Scott, W. R. (1998). A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Administrative Science Quarterly*, 43, 877-904.
- Rueschmeyer, D., & Stephens, J. D. (1997). Comparing historical sequences - A powerful tool for causal analysis. *Comparative Social Research*, 16, 55-72.
- Sahlin-Andersson, K. (1996). Imitating by editing success. The construction of organizational fields and identities.
- Sahlin-Anderson, K., & Engwall, L. (2002). Carriers, flows and sources of management knowledge. *The Expansion of Management Knowledge, Stanford*.
- Sahlin, K., & Wedlin, L. (2008). Circulating ideas: Imitation, translation and editing. *The Sage handbook of organizational institutionalism*, 218, 242.
- Saka, A. (2004). The cross-national diffusion of work systems: Translation of Japanese operations in the UK. *Organization Studies*, 25(2), 209-228.
- Schreier, M. (2014). Qualitative content analysis. *The SAGE handbook of qualitative data analysis*, 170-183.
- Scott, W. R., M. Ruef, P. J. Mendel, and C. A. Caronna (2000). *Institutional Change and Healthcare Organizations: From Professional Dominance to Managed Care*. Chicago. University of Chicago Press.
- Searle, J. R. (1965). What is a speech act? *Perspectives in the philosophy of language: a concise anthology*, 2000, 253-268.
- Searle, J. R. (1985). *Expression and meaning: Studies in the theory of speech acts*. Cambridge University Press.
- Seefeld, R., & Rese, N. (2020). “A word is enough to the wise?!”: a study on narratives produced by the media when translating the role of the players involved in the Operation Car Wash in Brazil. *Cadernos EBAPE. BR*, 18, 124-141.
- Serres, M. (1982). The origin of language: Biology, information theory and thermodynamics. *Oxford Literary Review*, 5(1\2), 113-124.
- Sherer, P. D., & Lee, K. (2002). Institutional change in large law firms: A resource dependency and institutional perspective. *Academy of Management Journal*, 45(1), 102-119.
- Sherry Jr, J. F. (1988). Market Pitching and The Ethnography of Speaking. *Advances in Consumer Research*, 15.
- Smircich, L., & Stubbart, C. (1985). Strategic management in an enacted world. *Academy of Management Review*, 10(4), 724-736.
- Smullen, A. (2010). *Translating agency reform: rhetoric and culture in comparative perspective*. Springer.

- Smullen, A. (2010). The Role of Culturally Flavoured Stories and Their National Translations. In *Translating Agency Reform* (pp. 135-158). Palgrave Macmillan, London.
- Stake, R. E. (2005). Qualitative case studies.
- Stake, R. E. (2013). *Multiple case study analysis*. Guilford press.
- Strang, D., & Meyer, J. W. (1993). Institutional conditions for diffusion. *Theory and society*, 22(4), 487-511.
- Stemler, S. (2000). An overview of content analysis. *Practical assessment, research, and evaluation*, 7(1), 17.
- Stemler, S. (2001). An overview of content analysis. *Practical assessment, research & evaluation*, 7(17), 137-146.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, 20(3), 571-610.
- Suddaby, R. (2011). How communication institutionalizes: A response to Lammers. *Management Communication Quarterly*, 25(1), 183-190.
- Suddaby, R., Cooper, D. J., & Greenwood, R. (2007). Transnational regulation of professional services: Governance dynamics of field level organizational change. *Accounting, Organizations and Society*, 32(4), 333-362.
- Suddaby, R., & Greenwood, R. (2005). Rhetorical strategies of legitimacy. *Administrative science quarterly*, 50(1), 35-67.
- Sweetser, E. (1990). *From etymology to pragmatics: Metaphorical and cultural aspects of semantic structure* (Vol. 54). Cambridge University Press.
- Teulier, R., & Rouleau, L. (2013). Middle managers' sensemaking and interorganizational change initiation: Translation spaces and editing practices. *Journal of Change Management*, 13(3), 308-337.
- Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). *The institutional logics perspective: A new approach to culture, structure and process*. OUP Oxford.
- Todorov, T. (1984). *Mikhail Bakhtin: The dialogical principle* (Vol. 13). Manchester University Press.
- Tracey, P., Dalpiaz, E., & Phillips, N. (2018). Fish out of water: Translation, legitimation, and new venture creation. *Academy of Management Journal*, 61(5), 1627-1666.
- Van Veen, K., Bezemer, J., & Karsten, L. (2011). Diffusion, translation and the neglected role of managers in the fashion setting process: The case of MANS. *Management Learning*, 42(2), 149-164.
- Vaara, E., Tienari, J., & Säntti, R. (2003). The international match: Metaphors as vehicles of social identity-building in cross-border mergers. *Human Relations*, 56(4), 419-451.
- Vossen, E., & van Gestel, N. (2019). Translating macro-ideas into micro-level practices: The role of social interactions. *Scandinavian Journal of Management*, 35(1), 26-35.
- Wahid, F. (2013, March). Translating the idea of the e-government one-stop-shop in indonesia. In *Information and Communication Technology-EurAsia Conference* (pp. 1-10). Springer, Berlin, Heidelberg.
- Waldorff, S. B. (2013). Accounting for organizational ideas: Mobilizing institutional logics in translation. *Scandinavian Journal of Management*, 29(3), 219-234.
- Waldorff, S. B., & Greenwood, R. (2011). The dynamics of community translation: Danish health-care centres. In *Communities and organizations*. Emerald Group Publishing Limited.

- Wæraas, A., & Sataøen, H. L. (2014). Trapped in conformity? Translating reputation management into practice. *Scandinavian Journal of Management*, 30(2), 242-253.
- Wæraas, A., & Sataøen, H. L. (2015). Being all things to all customers: Building reputation in an institutionalized field. *British Journal of Management*, 26(2), 310-326.
- Wallén, C., & Kardell, K. (2018). Framing Sustainability: A Qualitative Study of the Translation of the 2030 Agenda.
- Wedlin, L., & Sahlin, K. (2017). The imitation and translation of management ideas. *The SAGE handbook of organizational institutionalism*, 102-127.
- Wahlström, N., & Sundberg, D. (2018). Discursive institutionalism: Towards a framework for analysing the relation between policy and curriculum. *Journal of Education Policy*, 33(1), 163-183.
- Westphal, J. D., Gulati, R., & Shortell, S. M. (1997). Customization or conformity? An institutional and network perspective on the content and consequences of TQM adoption. *Administrative Science Quarterly*, 366-394.
- Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311-325.
- Yin, R. K. (1994). Case study research: Design and methods, applied social research. *Methods series*, 5.
- Yin, R. K. (2012). Case study methods.
- Yin, R. K. (2015). *Qualitative research from start to finish*. Guilford Publications.
- Zand-Vakili, E., Kashani, A. F., & Tabandeh, F. (2012). The Analysis of Speech Events and Hymes' SPEAKING Factors in the Comedy Television Series: "FRIENDS". *New Media and Mass Communication*, 2, 27-43.
- Zbaracki, M. J. (1998). The rhetoric and reality of total quality management. *Administrative science quarterly*, 602-636.
- Zilber, T. B. (2002). Institutionalization as an interplay between actions, meanings, and actors: The case of a rape crisis center in Israel. *Academy of management journal*, 45(1), 234-254.
- Zilber, T. B. (2006). The work of the symbolic in institutional processes: Translations of rational myths in Israeli high tech. *Academy of management journal*, 49(2), 281-303.
- Zilber, T. B. (2007). Stories and the discursive dynamics of institutional entrepreneurship: The case of Israeli high-tech after the bubble. *Organization studies*, 28(7), 1035-1054.

APPENDICES

TABLE 1: SEARCH TERMS FOR NEUROSCIENCE OF ADDICTION AND MENTAL HEALTH IN ALBERTA

TERM	ALTERNATE SEARCH TERMS
Neuroscience	brain science; neuro research; brain research; neuro-; brain; neurobiology
Addiction	substance use; substance abuse; substance issues; gambling; problem drinking; addict
Mental Health	mental illness; mental well-being
Adverse Childhood Experiences	early brain development; brain development; early trauma; chronic stress; brain architecture; toxic stress; early childhood experiences; brain plasticity
Origins of Addiction	cause/origin of addiction; cause/origin of substance use; cause/origin of substance abuse; addiction/substance use/substance abuse
Concurrent Disorders	co-occurring disorders; comorbid disorders; addiction/substance abuse/substance use and mental health issues/disorders; dual diagnosis; dual disorder

TABLE 2: TIMELINE OF IMPORTANT EVENTS INFORMING ADDICTION AND MENTAL HEALTH IN ALBERTA

Era	Era Description	DATE	EVENTS
Era 0 (prior to policy mention)	incredible milestones in brain imaging techniques, and eventually led to addiction and mental illness both being defined as illnesses of the brain; strategic development of metaphors to align Albertan perceptions with current research findings	1990	AB Mental Health Patient Advocate (MHPA) established under the Mental Health Act
		1990 (Jan)	Mental Health Act of AB proclaimed
		1991	Rotary Club and AB government establish AB Adolescent Recovery Centre (AARC) in Calgary to provide long term treatment (has 80% success rate); uses 12 step, positive peer pressure and family/group therapy
		1992	National Drug Strategy Phase 2: Canada launches second national strategy to reduce impaired driving called Canada's Drug Strategy
		1992	Canada's first PET centre opens
		1994	Canadian Institute for Health Information (CIHI) is established under the Canadian Corporations Act, which is a mandate to integrated approaches to health information and provision of data about policy, delivery awareness of factors involving the promotion of good health; manages national health administration data
		1998	Canadian Alliance on Mental Illness and Mental Health Founded
		1999	National Drug Strategy Renewed - Canada reaffirms commitment to NDS and takes 4 pillars approach to health (education and prevention; treatment and rehabilitation; harm reduction; enforcement and control) Renewed until 2003
		1999	CAMIMH & Centre for Chronic Disease Prevention and Control & Public Health Agency of Canada (PHAC) hold a workshop on mental health and mental illness indicators (followed by 2005 workshop)
		1999	National mental health surveillance post workshop
		1999	CIHI launched the Canadian Population Health Initiative (CPHI) to foster a better understanding of factors affecting health, contributing to policies the decrease inequities and increase health and well-being of Canada
		2001	Controlled Drugs and Substances Act amended to allow for legalization of cannabis for medical purposes
		2001 (July)	AB establishes Children's Mental Health Initiative
		2002	Health Canada publishes "A Report on Mental Illness in Canada", lists future needs by mental disorders and information gaps (NOT PLANS) for future surveillance (NOT MENTIONED UNTIL 2006 report)
		2003	Insite opens - first safe injection site in North America opens in Vancouver, provides users with clean place to inject drugs and to connect to health care services
		2003 (April)	RHAS responsible for policy, funding, service for mental health and addiction; provision for front line clinical services
		2004	Norlien Foundation (later Palix Foundation) aims to improve children's and families' health and wellbeing in Alberta
		2004	Public Health Agency of Canada created: takes over mental illness surveillance and promotion from Mental Health Promotion Unit & Centre for Chronic Disease Prevention & control at Health Canada

		2005	National Framework for Action to Reduce the Harms Associated with Alcohol and Drugs and Substances in Canada - report released by CCSA developed collaboratively with multi sector partnerships
		2005	At a workshop, PHAC commits funds for further consultation, feasibility and demonstration projects and to have proposed mental illness surveillance system for March 2007
		2005	CAMINH, CCDPC & PHAC hold workshop to develop strategies for expanding mental illness surveillance in Canada (followed 1999 workshop on mental illness indicators)
		2006	<i>Out of the Shadows At Last</i> : In October 2004, Standing Senate Committee of Social Affairs, Science and Technology authors to examine health care system, with a focus on mental health and addiction; lived experiences provided the foundation for the first Mental Health Strategy Document, and is the basis for the creation of the Mental Health Commission of Canada (spring 2007)
		2006	<i>Positive Futures - Optimizing Mental Health for Alberta's Children and Youth- A Framework for Action, 2006-2012</i> published, informs Alberta's Addiction and Mental Health Strategy (2011)
		2006	Standing Senate Committee report <i>Out of the Shadows at Last</i> to recommend new MHCC work with PHAC for national mental illness surveillance system
		2006	WHO provides <i>Economic Aspects of the Mental Health System and Key Messages to Health Planners and Policymakers</i> ; shift away from cost-ineffective structures and practices to more effective allocation of resources
		2006	PHAC develops Mental Illness Surveillance Advisory Committee to advise about the development, use and evaluation of information surveillance; 12-15 members provide relevant experience in academic, professional, NGO (including MHCC and CIHI)
		2006	positive Futures - Optimizing Mental Health for Alberta's Children and Youth- A Framework for Action, 2006-2012 published, informs Alberta's Addiction and Mental Health Strategy (2011)
		2006 (February)	Research round table held, consisting of funding agencies, consumers, researchers, policymakers and service providers meet to establish mental health research agenda for Alberta. Key themes of partnerships, business plan, outline, effectiveness, children and youth, workplace mental health, mental illness & addiction
Phase 1 (first mention in policy to 2011)		2007	Alberta Family Wellness Initiative founded, and integrates narratives of the "Core Story of Brain Development" developed by the Harvard Center and FrameWorks
		2007	Mental Health Commission of Canada created based on 2006 <i>Out of the Shadows at Last</i>
		2007 (March)	PHAC proposes national mental illness surveillance system
		2007	PHAC releases 5-year strategic plan that focuses on integrated knowledge functions and information
		2007	CCSA leads National Treatment Strategy Workgroup which develops a 5-tier <i>Alberta Health Services Integrated Addiction and Mental Health System Model</i> , which Alberta's <i>Addiction and Mental Health Strategy</i> (2011) builds upon
		2007	CPHI report <i>Mental Health and Homelessness</i>
		2007	<i>National Anti-Drug Strategy</i> (changed from <i>National Drug Strategy</i>); harm reduction remed as one fo pillars, strategy carried out by 12 federal departments and agencies, led by Department of Justice Canada; Aims to decrease prevalence of harmful drugs, the number of Canadians experimenting with drugs, rates of drug use, communicable diseases and aims to promote alternative justice measures while decreasing costs associated with drug use
		2008	Alberta Restructures Health Services
		2008	CPHI Report - <i>Mental Health, Delinquency and Criminal Activity</i>

		2008	<i>Children's Mental Health Plan for Alberta, 3 Year Action Plan 2008-2011</i> ; informs <i>Alberta Addiction and Mental Health Plan (2011)</i>
		2009	CIHI produces two smaller projects on mentally healthy communities: 1. collection of related papers 2. Aboriginal perspectives THEN.... public views survey on mental health among Canadians
		2009	CPHI Report - <i>Exploring Positive Mental Health</i>
		2009	PHAC announces \$15 million, 4-year initiative about neurological conditions including dementia; aim to fill knowledge gaps about Canadian conditions, results reported Fall 2014
		2009	MHCC's <i>Toward Recovery and Well-Being: A Framework for a Mental Health Strategy for Canada</i> emphasizes the need for a national strategy
		2009	Statistic Canada and CIHI conduct survey and collect other data in <i>2009 Canadian Community Health Survey</i> including mood disorders, heavy drinking, perceived life stress and life satisfaction fact sheets
		2009	CCSA produces <i>Canadian Centre on Substance Abuse Report</i> (NOTE NGO) that highlights the importance of addressing concurrent mental illness and substance abuse and implicates fragmentation on behalf of the current system
		2009	<i>Towards Recovery and Well-Being: A Framework for Mental Health Strategy in Canada</i> - produced by MHCC provincial framework and informed by stakeholder consultations; was the initial phase of MHCC development of the first national <i>Mental Health Strategy</i> released in 2012
		2009	AFWI engages FrameWorks to understand brain development in the Alberta context as well as the Core Story of brain development
		2010	AFWI partners with Alberta Government with three-year interdisciplinary knowledge mobilization initiatives through two annual symposia (Early Brain and Biological Development (spring); Recovery from Addiction (fall))
		2010	PHAC identifies mental health as a strategic priority; sponsors international workshop on the development of an operational definition of mental health
		2010	PHAC expands CCDSS to include mental illness, providing the first ever data on population using health services (physicians/hospitals) and for the first time included children
		2010	FrameWorks commissioned two experimental online surveys about existing values and models about early development, mental health and addiction
Era 2 (2011-2015)	AFWI becomes especially active in promoting the brain story to Albertan populations	2011	AFWI communicates the brain story to practitioners within field of addiction and mental health through a series of webcasts, video clips, presentations and lectures; develops website as resource for practitioners, families and policymakers
		2011	AHS and AB Government publish <i>Creating Connections: Alberta's Addiction and Mental Health Strategy</i> - aim to transform the addiction and mental health system in Alberta to decrease prevalence via promotion and prevention activities, assessment, treatment, and support services
		2012	<i>Mental Health Strategy for Canada</i> released and includes notes the importance of data collection and uses to measure progress in system transformation
		2012	Mental Illness Surveillance Advisory Committee (developed by PHAC in 2006) expanded mandate - monitoring positive mental health is now called for; also renamed Mental Health and Mental Illness Surveillance Advisory Committee
		2012	CCHS commences mental health data collection
		2012	<i>Changing Directions, Changing Lives: The Mental Health Strategy For Canada</i> published as the first national mental health strategy, led by MHCC as part of its mandate when created in 2007; builds on the national framework <i>Changing Directions, Changing Lives (2009)</i> ; outlines recommendations for action to create a mental health system as envisioned by the framework; emphasizes mental health promotion across the lifespan, increased access to treatment and supports decreased disparities and risk factors; promotes need to take whole government approach

		2013	<i>First Do No Harms: Responding to Canada's Prescription Drug Crisis</i> - report published by CCSA in response to Canada's increased opioid problem and presents 58 short and long recommendations
		2013 (May)	Leader's Forum: SAC presents key areas of focus for what works best for collaborative strategies
		2013	Two articles from 2012 produced by CCHS from <i>Mental Health Survey</i> (first inclusion of generalized anxiety disorder): <i>Mental and Substance Abuse Disorders in Canada in Health at a Glance; another article Perceived Need for Mental Health Care in Canada in Health Reports</i>
		2013	PHAC feasibility work explores the potential expanse of CCDSS to include other mental illnesses including psychosis and substance abuse disorders
		2013	Federal government (including PHAC development and finalizing the mental health framework) announces reallocation of \$2 million to increase data collection and reporting of mental illness and mental health as recommended by the Mental Health Strategy for Canada to increase knowledge and foster collaboration (2012)
		2013	<i>Health System Performance</i> - indicators via joint CIHI-Stats Canada Health reporting project; 2 projects are introduced to increase Canadian health information systems - 1. Interactive website (ourhealthsystem.ca) and explores 5 performance measures 2. CIHI's 'Indicator Library' from hospital discharge data on hospital care for mental illness and inappropriate anti-psychotic medications over long-term care
		2014	PHAC summary report - ongoing surveillance of suicide and self-inflicted injuries via national administrative data (versus self-report)
		2014	PHAC releases first of two volumes of national data on mental illness and mood/anxiety disorders using new data from CCDSS (began collecting in 2010)
		2014 (Fall)	PHAC releases results of 4-year study on neurological conditions
		2014 (October)	Network of Mental Health Rights - inaugurated via teleconference by MHPA and U of A grad student; promotes and supports legislated rights and of voice of people affected
		2014	Reporting to health System Performance moves to electronic, interactive format; indicators include mental illness hospitalizations, mental illness patient days (especially remission)
		2014	Quick Stats, in <i>Mental Health and Addiction Data and Information Guide, 2014"</i> lists health system indicators (see CIHI's Indicator Library, 2014)
		2014	CIHI produces <i>Mental Health and Addiction Data and Information Guide</i> - provides an overview of CIHI mental health and addiction information available in its data holdings and publicly available information' makes it easy to find data about performance, population health, care types, pharmacies, healthcare workforce, and spending
		2014 (january)	CCSA releases <i>Third National Treatment Indicators Report</i> (using 2011-2012 data) that aims to fill information gaps on increased substance abuse, and the treatment system, with first reports to prioritize Canada wide public funding for substance use treatment services
Era 3 (2015 onward)	NDP is voted into government, develops several initiatives to promote mental health of Albertans	2015	Addiction and Mental Health Strategic Clinical Network (AMH SCN) and AB addiction and Mental Health Research Partnership program (AAMHRPP) hold their first research strategy planning meeting
		2015	AFWI begins hosting hundreds of locally targeted presentations and sessions for professional development across Alberta
		2015	Alberta Post-Secondary Mental Health and Addiction Framework released
		2016	AFWI launches online Brain Development course for practitioner and public audiences to promote understanding of the science of brain development, addiction and mental health; brain science of ACEs becomes framework for conversations about early childhood experiences and mental health outcomes

		2016 (Feb)	Alberta Mental Health Committee Report published with 32 recommendations
		2016 (Nov)	Valuing Mental Health: Next Steps proposes 18 actions that address ABMH recommendations
		2017 (Sept)	Alberta Government provides funding for mental health and addictions services for Edmonton Post-Secondary students

TABLE 3: CASES AND RELEVANT RESEARCH

<p>CASE 1: ACEs</p> <p>-M.H. Teicher et al. (1994; 1997) – effects of abuse on brain development</p> <p>-V.J. Felitti & Robert Anda (2004; 1998) – ACE and toxic stress – CDC’s Adverse Childhood Experiences Study; childhood abuse affects brain development & risk of substance abuse and mental illness; neurobiology of childhood trauma; obesity and ACE</p> <p>-B.S. McEwen et al. (1998) –neuroendocrinology and stress – need to decrease allostatic load (from chronic, early stress) via coping skills and interventions combating isolation and lack of control at work; activity in HPA axis; neuroendocrinology of stress and aging; children’s cortisol/stress hormone levels; pioneered “allostatic load” as interaction between brain, body, stress; stress and hippocampal plasticity</p> <p>-B.D. Perry & R. Pollard (1994; 1998) - stress and trauma on brain</p> <p>-G.R. Gunner (1996)</p> <p>-Putnam (1994; 2003) – child sexual abuse</p> <p>-Rutter, M (2000) – child and adolescent development</p> <p>KOOB (2008)</p>
<p>CASE 2: ORIGINS OF ADDICTION-</p> <p>Ian Hacking (1995) – looping effects of human minds</p> <p>-George F. Koob (1998) – neuroscience of addiction</p> <p>Koob et al. (1998) demonstrated the neural basis of addiction, and identified specific regions of the brain as well as neurotransmitters that underlie the arousal of neural reward and motivation systems associated with drug use</p> <p>-Antonio Damasio (1996)- somatic marker hypothesis</p> <p>-Harold Kalant (2009)- what neurobiology can’t tell us about addiction</p> <p>-Trevor Robbins & BJ Everitt (1996)- neuralbehavioural mechanisms of reward and motivation</p> <p>-Goldberg, SR</p> <p>-Alan Leshner (1997) – addiction as brain disease</p> <p>-AT McLellan et al.</p> <p>-O’Brien, CP</p>
<p>CASE 3: CONCURRENT DISORDERS</p> <p>-Markou, Kosten & Koob (1998)- neurobiological similarities in depression and drug dependence</p> <p>-Kessler et al (1996; 1999)- epidemiology of addiction and mental disorders</p> <p>-Koob (2009)</p> <p>-Koob & LeMoal (2005)</p> <p>-Heilig & Koob (2007)</p> <p>-Volpicelli et al (1999)- PTSD and drinking; stress circuitry</p> <p>-Adinoff (2005)</p> <p>-Junghanns et al (2003)</p> <p>-Brady KT et al (2001;2006)- stress and SUDS; cold pressor task</p>

TABLE 4: MINISTRIES, AIMS, SERVICES

MINISTRY	AIM	FOUNDING DATE	KEY SERVICES	RESPONSIBILITIES	MINISTRY INFORMATION
AB HEALTH	Sets policy and direction to achieve a sustainable and accountable health system to promote and protect the health of Albertans.	-AB HEALTH first minister appointed June 19, 1919 -Alberta Health Services was created as a "superboard" announced May 2008 and was effective as of April 1, 2009. This dissolved several regional health authorities	-Alberta Health Care Insurance Plan -Health Information -Health Services and Benefits -Office of the Chief Medical Officer of Health -Primary Health Care -Resources for Health Professionals and Delivery	Alberta Health is responsible for: -setting policy, legislation and standards for the health system in Alberta -allocating health funding -administering provincial programs such as the Alberta Health Care Insurance Plan -providing expertise on communicable disease control -implementing and ensuring compliance with government policy NOTE: Health services are planned and delivered by Alberta Health Services. Some public health services may also be provided by private health care clinics, for example, dentists' offices.	Publications Annual reports Budget documents Business plans Ministry publications Resources Legislation List of public agencies Media inquiries Personal information bank directories Staff directory Health Advocates Health Quality Council of Alberta MyHealth Alberta
AB EDUCATION	Alberta Education supports students, parents, teachers and administrators from Early Childhood Services (ECS) through Grade 12.		-Diverse Learning Needs -Early Childhood Education -First Nations, Metis and Inuit Education -French Language Education in Alberta -Learn Alberta -Provincial Assessments -Safe and Caring Schools -Student Information -Teaching in Alberta	Through safe and caring schools for all students, Alberta's government is making life better by investing in education – one of the most important investments we can make in our future. The Ministry has the following responsibilities: -develop curriculum and set standards -evaluate curriculum and assess outcomes -teacher development and certification -support students with diverse learning needs -fund and support school boards -First Nations, Métis and Inuit and Francophone education -oversees basic education policy and regulations	Publications Annual reports and updates Budget documents Business plans Guide to Education Ministry publications Resources Accountability in Alberta's K to 12 education system Financial statements Interchange opportunities Legislation List of public agencies Media inquiries Personal information bank directories Staff directory

TABLE 5: DOCUMENT TYPE PERCENTAGES

Document Type	Percentage of Total Documents
REVIEW (including information supplements, literature reviews, conference summaries, environmental scans)	19%
STRATEGY	8%
PLAN (including initiatives, action plans, frameworks for action, funding plans)	10%
GUIDE (including handbooks, tool kits, resource guides)	16%
ROUTINE PUBLICATION (including magazines, newsletters)	22%
REPORT (including annual reports, final reports, budget reports, strategy reports)	19%
RECOMMENDATION (including recommendations for strategy, recommendations for planning, recommendations for funding)	6%

TABLE 6: S.P.E.A.K.I.N.G ELEMENTS OF SPEECH EVENTS

ELEMENT	DEFINITION	EXAMPLES
Setting	the physical and temporal locale, as well as the social meaning of the text	<i>Phase 0: Initial publication of research - First policy mention</i> <i>Phase 1: First mention in policy - 2011</i> <i>Phase 2: 2011-2015</i> <i>Phase 3: 2015-present</i>
Participants	both speakers and intended or unintended audience members involved in communication, including their professional designations, roles and the nature of their relationships	ALBERTA HEALTH ALBERTA EDUCATION (Audiences: General public; policymakers; practitioners; family or parents; decision-makers)
End	The desired and actual outcomes of the particular text	Inform; propose; review; recommend; shaping policies and services; improve quality; provide a model; translate; increase awareness; advocate; develop a framework; present findings; request for action; provide an overview; explore topic; define; summarize
Act Sequence	the specific order of events and the format of communication that is used	NOT INCLUDED IN ANALYSIS
Key	the tone or manner in which information is presented within a given text, which can vary even throughout one text	NOT INCLUDED IN ANALYSIS
Instruments	The editing rules, forms, styles and types of language that are used to convey meaning within a text	Context Rules Logic Rules Formulation Rules
Norms	to the rules that govern how meaning is to be made within the particular context of a communicative act	NOT INCLUDED IN ANALYSIS
Genre	the specific type of communicative act or narrative that is in question	Discussion paper; plan; summary; report; research article; magazine; workbook; environmental scan; framework; newsletter; overview; brochure; press release; proposal; resource kit

TABLE 7: CASE 1 (ACEs) GENERAL SPEAKING TRENDS BY PHASE

Setting		Phase 1 (2006-2011)	Phase 2 (2011-2015)	Phase 3 (2015-2019)
Participants (Author→ Audience)	Alberta Health→	Policymakers Researchers	General public Policymakers	Practitioners General Public Policymakers
	Alberta Education→	Decision-makers	Practitioners Caregivers	Practitioners Caregivers
Ends		-Improve services by understanding current information and science -Provide funding, direction for initiatives -Provide information about ongoing research -Make recommendations	-Improve services through evidence and science-based approaches -Promote dialogue and engagement -Provide information about current research -Provide resources for networking and professional development	-Provide recommendations for science-based service provision -Provide resources for and information about specific evidence-based practices -Create plans for addressing recommendations -Resource allocation
Instruments	Context	Research shows that early childhood experiences, trauma and brain development play important role in later mental health and addiction of Albertans	Current research shows that addiction and mental illness in Alberta are correlated with early and prolonged activation of stress responses caused by toxic stress	Understanding the science behind how the brain changes when exposed to toxic stress is important for prevention, intervention and treatment of addiction and mental health in Alberta
	Logic	-Early experiences of trauma correlate with later mental health and addiction issues -Develop pilot projects around early development -Need to optimize mental health of children by understanding science of early brain development -Need more research to better understand how to provide appropriate services and reduce risks	-Early experiences influence brain development and exposure to adverse childhood events can increase likelihood of developing later mental health and addiction issues -Need to foster healthy development of children via positive environments and caring relationships across service provision	-Traumatic experiences cause toxic stress, which derails brain development especially with negative relationships -Must increase protective factors by coaching caring adults to support resiliency and future success -Need to integrate trauma-informed practices and youth programming to meaningfully impact development
	Formulation	Labels: Trauma Early experiences Well-being Preventable Risks Resiliency Protective factors Risk factors	Labels: Trauma Brain plasticity ACEs Early experiences Biologically embedded Well-being Metaphors: Toxic stress Brain architecture Brick wall Serve and Return Brain faultlines Levelness Air traffic control	Labels: Traumatic experiences ACEs Early experiences Resiliency Trauma-informed practice Wellness Metaphors: Toxic stress Brain architecture Buffering Serve and Return Brain Faultlines Stress gets under skin
Genres		Reports Fact sheets & information guides Consensus Statement Plans	Plans/Strategies Routine publications Reports	Resource Guides Reports Routine publications

TABLE 8: CASE 1 (ACEs) REPRESENTATIVE QUOTES by PHASE and EDITING RULES OF TRANSLATION

	AUTHOR	REPRESENTATIVE QUOTES	SUMMARY OF EDITING RULES
Phase 1 (2006-2011)	Alberta Health	<p>As a pilot project, [we will] establish a multi-disciplinary infant/preschool assessment intervention clinic to provide comprehensive neurodevelopmental and mental health services for infants and young children who have experienced trauma, including foster children. [Alberta Mental Health for Children; Plan; 2008; pp. 9]</p> <p>Early experiences in childhood and adolescence can play a critical role in development of depression. Indeed, the majority of depressed people experience their first symptoms during childhood or adolescence. Traumatic events in childhood (e.g., abuse, neglect, and household dysfunction) have an impact on physical and mental health throughout a person's life. [...] People presenting for assessment of depression by health care providers should be asked about the presence or absence of trauma and adverse childhood experiences. A better understanding by service providers of the relationship between substance use disorders, chronic diseases and depression is essential for the optimal prevention, early detection and effective intervention of these disorders. [Consensus Statement on Depression in Adults, 2008, pp: 7]</p> <p>Studies show that children tend to do better in strong, supportive communities. Community resources can offset the impact of poverty and other risk factors on early development. Communities are key players in the Early Child Development (ECD) Mapping Initiative, which will enable Albertans to better understand and support the development of young children. How do communities influence early childhood development? A child's early experiences (from birth to age five) shape the structure of the rapidly developing brain. The quality of early experiences is influenced by the environments in which children are raised. Children who have access to nurturing, stimulating and safe environments during their early years have fewer developmental difficulties and experience better health, learning, relationships and well-being. [ECMap Fact Sheet, 2010, pp: 1]</p> <p>To understand how to prevent alcohol and drug abuse, it is also important to understand the connection between risk factors and protective factors. These are concepts well-supported by many years of research. [...] A lot of research has been done in the area of resiliency to try to understand how some young people who struggle against the odds (have many risk factors in their lives) seem to be able to overcome these challenges and develop into healthy, happy adults. This important research has clearly pointed to the critical role that protective factors play in the lives of all young people. [AHS; Kids and Drugs Parents Booklet; 2010; pp. 9-11]</p> <p>"[C]linicians and policymakers are increasingly aware that health "develops" during childhood, and there is a critical need to not just maintain but optimize the health of children. Decades of brain research document the role of early experience in determining emotional well-being and lifelong learning [...]" [Alberta's Research and Idea Strategy, 2010, p. 23].</p>	<p>Logic: P-S rationale based on C-E relationships (In response to extant research findings on early experiences, develop a pilot project to provide care for children exposed to trauma) Formulation: Label (mental health, trauma)</p> <p>Logic: C-E relationship (early experiences of trauma impact mental health); P-S rationale (service providers need to understand this C-E relationship for prevention and intervention) Formulation: Label (early experiences, trauma, substance abuse, mental health, chronic diseases)</p> <p>Logic: C-E relationship (early experiences shape brain development); P-S (children need environments that promote healthy development) Formulation: Label (early experiences; brain development)</p> <p>Logic: C-E relationship (protective and risk factors in early years link to addiction); P-S rationale (Developing resiliency among youth can promote mental health) Formulation: Label (protective and risk factors; development; resiliency)</p> <p>Logic: C-E relationship (early experiences are related to well-being) Formulation: Label (early experiences, development; well-being)</p>
Phase 2 (2011-2015)	Alberta Health	<p>When a child is raised in a constantly stressful environment – including unsafe and neglected neighbourhoods – we refer to this as "toxic stress." [...] This kind of childhood stress is linked to problems later in life including alcoholism, depression, eating disorders, heart disease,</p>	<p>Logic: C-E relationships (early experiences and environments linked to toxic stress, brain development and</p>

	<p>cancer and other chronic diseases. [...] Toxic stress is particularly harmful during the first years of life. During this phase of rapid brain development, the young child’s brain is extremely sensitive to experience. Experiences that are chronically disruptive, abusive, neglectful or unpredictable, flood the brain with harmful chemicals. In large, persistent doses, these chemicals impair the growth of neurons and make it harder for the brain to form healthy connections. In this way, toxic stress leaves lasting biological damage on brain structure and function. [...] Over time, the effects of toxic stress on brain structure and function can make children more rigid and less capable of independent problem solving. The changes in brain structure and function caused by toxic stress are cumulative. Not only does toxic stress affect brain development during a given stage, it affects the next stage and all other stages that build on earlier development. Like a brick wall, when one brick is set badly the whole structure is affected. Harm builds upon harm. [...] Young children who experience toxic stress – whether from abuse, neglect, severe maternal depression, substance abuse by parents or high levels of parental conflict over long a long period of time – need more targeted and intensive interventions. These interventions should provide services that are matched to the needs they are designed to meet. Early and intensive intervention can help to prevent disruptions in development and promote better outcomes. For example, individual “coaching” to increase awareness of child behaviors and teach positive parenting practices can benefit both parents and children. Treatment for mothers who experience severe depression and teaching to help them protect their children from the effects of their illness can help the whole family. [Let’s Talk About the Early Years, Report, 2011, pp. 17-18]</p> <p>We now know that the basic architecture of the human brain is constructed through an ongoing process that begins before birth and continues into adulthood. Early experiences literally shape how the brain gets built. Just like building a house, it is step-by-step, beginning with a strong foundation, including supportive and resilient families and communities. Exposure to chronic and serious early stressors creates an exaggerated stress response in the brain and body that, over time, may erode the solid foundation on which mental health develops. This leaves affected people without the stability they need to be able to adjust to situations and function effectively. [...] [pp.3]</p> <p>A strong foundation in a child’s early years increases the probability of positive outcomes. A weak foundation increases the odds of later difficulties, including later mental health problems and addiction. Fostering the development of healthy children, youth and families can help support good mental health in the first place. It means responding appropriately to shore up the foundation for people when they need it by buffering exposure to toxic stress. [...] This strategic direction focuses on all children, youth and families, including seniors, and recognizes the need to increase capacity and support across the service continuum. Risk will be reduced by creating environments that build individual and family resiliency, and provides access to the services and supports children, youth and families may need. [...] A strategic priority is to develop a full Continuum of Services for Children, Youth and Families [by] provid[ing] all children, youth and their families, including those “at risk” and “in care,” with access to the full continuum of services with strong links to community treatment and community supports. [Creating Connections Strategy, 2011, p. 20]</p> <p>Genes and experiences interact to determine an individual’s vulnerability to early adversity. Environmental factors appear to be at least if not more powerful than genetic predispositions in their impact on the odds of having chronic health problems later in life. Neuroscience clearly shows that on-going toxic stress, such as child abuse, neglect, poverty, maternal depression, substance abuse or family violence can damage the developing brain. Research has found that toxic stress experiences often co-occur; each additional stress increases the potential for damage to the developing brain. Seventy per cent of children experience one or more Adverse Childhood Events such as</p>	<p>development of mental health and addiction issues); P-S rationales (early intervention for affected youth, treatment Formulation: Label (early experiences; chronic disease); Metaphor (toxic stress, brain architecture; brick wall; coaching)</p> <p>Logic: C-E and P-S rationales (Early experiences of toxic stress correlate with later mental health and addiction, this can be mitigated via positive environments that build resiliency); P-S rationale based on C-E relationships (to address relationship between early experiences and later mental health, we need to provide access to continuum of services) Formulation: Label (early experiences, mental health, addiction, resiliency; risk), Metaphor (toxic stress; brain architecture, brain gets built step by step, building a house, foundation)</p> <p>Logic: C-E relationship (environmental factors and early experiences of toxic stress damage brain and affect mental health) Formulation: Label (vulnerability, adversity, adverse childhood events; early experiences; chronic health problems; risk’ mental</p>
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	<p>Alberta Education</p>	<p>The foundation for strong and healthy children is set in early childhood, starting even before they are born. Clear scientific evidence tells us that brain development is influenced by early childhood experiences. Brain development is optimal when children grow up with safe and healthy environments, loving and supportive relationships and opportunities to learn. [...] If children are exposed to traumatic events and ongoing stress such as witnessing or experiencing family violence, living in poverty, or being subjected to neglect or abuse, brain development may be impaired. Children living in these environments are more likely to face developmental difficulties, poor health and be less prepared for school. This can set a course for challenges and difficulties for children that can last throughout their lifespan. [...] All developing children need a healthy start, nurturing relationships, and safe, supportive environments to grow, learn and thrive. These positive and caring interactions support healthy development and can buffer the impacts of negative experiences and environments. Our children’s lifelong health and future successes in school, work and relationships depend on it. [We can d]evelop healthy brains [by understanding that]: Experiences Build Brain Architecture Early [and] experiences establish either a sturdy or a fragile foundation for all of the learning, health, and behavior that follow. Serve and Return Interactions [or] back-and-forth vocalizing and gestures are fundamental to the wiring of the brain, especially in the earliest years. Toxic Stress Derails [and] unrelenting stress caused by extreme poverty, neglect, or abuse can affect healthy development. [Together We Raise Tomorrow, Plan, 2013, p. 6]</p> <p>Our youth-driven programming engages head-on the issues of addictions and mental health with successful and meaningful impact on the youth and therefore the health of communities. Our youth deal with toxic stress on a daily basis—poverty, homelessness, addiction use or abuse, mental health issues, fetal alcohol syndrome, gang affiliation or membership and familial neglect—which means that our youth are often known to the criminal justice or child welfare systems. A significant majority also exhibit some brain trauma or compromise to their brain development and functioning. These youth are already experiencing mental health challenges; however, because of the challenges listed above, they tend not to be patients of the mental health care system. [Steps ECMap newsletter Vol 34, No. 1; routine publication; 2014; pp. 27]</p>	<p>Logic: C-E and P-S rationales (early experiences influence brain development, affect school success and future health; we can promote healthy development via positive interactions and environments)</p> <p>Formulation: Label (early experiences, brain development, trauma, stress); Metaphor (toxic stress; brain architecture, serve and return)</p> <p>Logic: C-E relationships (early experiences toxic stress can affect brain development and mental health)</p> <p>Formulation: Label (trauma, brain development, mental health); Metaphor (toxic stress)</p>
<p>Phase 3 (2015-2019)</p>	<p>Alberta Health</p>	<p>[Our goal is to] create public awareness opportunities and programs to enable people to support their own mental health and the health of those they care about through collaboration between the Government of Alberta and non-government organizations including: a. Educating the public on brain development, and risk and protective factors related to addiction and mental illness; and b. Supporting individuals to develop skills to engage in conversations that reduce stigma and direct people to help. Understanding how our early experiences shape brain development is important for prevention, intervention, and treatment of addiction and mental illness. Work by organizations, such as the</p>	<p>Logic: C-E and P-S rationales (early experiences shape brain development and we need to, via collaboration, educate the public, a promote skill development via stigma reducing conversations)</p> <p>Formulation: Label (early experiences, brain</p>

		<p>Alberta Family Wellness Initiative, has contributed to research and knowledge in this field. [Alberta Mental Health Review; Report; 2015; pp. 22]</p> <p>Bridging can keep you connected to your kids and takes several forms: cards, phone calls, mementoes handwritten notes, texting, emailing or Skyping This kind of support is always there for parents and is even more critical when one parent is away for long stretches of time. What happens to children when they're separated from a parent for days, weeks or months? "The answer is complicated," Campos says. It all depends on the care and support children get from their parents and other adults in their lives such as aunts and uncles, grandparents, neighbours and teachers. If a child's parents often and heatedly fight and ignore their children, this can put stress on their children. When that stress doesn't go away, it can become toxic and alter brain development. In turn, this toxic stress can put children at a higher risk of insecurity, anxiety and depression, difficulties in school, trouble sleeping and lack of focus. On the other hand, when families have strong connections—even when one parent is away—their children have a better chance of being productive and satisfied, and of sleeping well, eating healthy and coping with stress. Bottom line: children are happier and healthier when parents work together, even when they're apart. [Apple Magazine Issue 22; Summer 2016; AHS and Alberta Innovates Health Solutions; magazine]</p> <p>Children who are neglected or abused or in dysfunctional families are at risk of toxic stress. Toxic stress is chronic, constant stress and can be harmful, especially to children. An extensive body of evidence [...] documents that when children feel unsafe—when there is chronic child maltreatment, for example—it interferes with developing neural networks, resulting in a shift from a learning brain to a survival brain. A lack of security can lead to toxic stress. Over time, toxic stress can affect brain architecture, sometimes leading to learning delays, problems with memory recall and mood, depression, addiction and anxiety later in life. [...] Without nurturing and supportive relationships to offset the effects of toxic stress, its symptoms can last a lifetime. When children are supported by stable, caring relationships, they can avoid toxic stress. These relationships also give them the freedom to think, speak and act without fear of loss or punishment. One of the most important jobs of parents and the other adults in a child's life is to help them express their emotions and to give them the freedom to do so. [Apple Magazine Issue 24, Routine Publication, 2017, pp 50]</p>	<p>development, risk, addiction, mental illness)</p> <p>Logic: C-E and P-S rationales (Early experiences of stress alter brain development; therefore, we need to build strong connections to promote healthy development of children) Formulation: Label (stress), Metaphor (Bridging, toxic stress)</p> <p>Logic: C-E relationship (early experiences of toxic stress affects brain development); P-S rationale (Children need positive relationships to avoid impact of toxic stress) Formulation: Label (risk, brain development); Metaphor (toxic stress, brain architecture)</p>
	<p>Alberta Education</p>	<p>Recent progress in neuroscience highlights the importance of welcoming, caring, respectful and safe learning environments that nurture well-being, and a positive sense of self and belonging. Healthy interactions and experiences shape the developing brain in positive ways; negative experiences interrupt brain development. On the other hand, interactions that are repeatedly negative or unresponsive can negatively impact learning, behaviour and well-being. Students who experience poor mental health may have been exposed to frequent or prolonged adverse childhood experiences that put them at risk. When students experience frequent or prolonged adversity, such as physical, sexual or emotional abuse; chronic neglect or abandonment; exposure to violence; or substance abuse of a family member; the stress experience can become intolerable and toxic. Toxic stress derails healthy development and can result in trauma. This is especially true when a student has no caring adult to act as a buffer. For further information on how the architecture of the brain is foundational for learning and mental health, see the video How Brains are Built. The effect of these adverse experiences on a child's developing brain increases the risk of long-term mental and physical health problems. To minimize these long-term health issues and protect students from the effects of toxic stress, we must increase the number of protective factors in a student's life while decreasing risk factors. [...] Risk or adverse factors are attributes, characteristics or experiences that increase the likelihood of illness or injury. Risk factors for students'</p>	<p>Logic: C-E relationships (early negative experiences are linked to brain development, trauma and mental health); P-S rationale (Need caring and supportive relationships to protect from adverse effects) Formulation: Label (early experiences, adverse childhood experiences, trauma, mental health, risk factors, protective factors); Metaphor (toxic stress, brain architecture, buffer)</p>

	<p>mental health may include events that challenge their social-emotional well-being such as unsupportive or negative interactions, isolation, learning delays, bullying, loss and grief, maltreatment including exposure to abuse (substance, physical, psychological, sexual), poverty, abandonment, malnutrition and transiency. Generally speaking, the more risk factors in a student's life, the higher the chances of them experiencing mental health difficulties. Protective factors lessen the effect or impact of risk or adverse factors. [Mental Health in Alberta Schools; Resource Guide; 2015; pp. 15-16]</p> <p>We will not be able to undo the number of ACEs a child has experienced. However, we can work to prevent an increase in their score and build protective factors moving forward. The part of the brain that governs executive functioning doesn't develop properly when exposed to toxic stress. As you probably know, this affects the ability to control impulses, regulate emotions, use reasoning, problem solve, plan, monitor conflict, and be flexible. In other words, children who are exposed to multiple ACEs lack the skills, and not the will to be good citizens. They need support to develop the skills they are lacking, within a trusting, collaborative relationship. Relationships have been found to buffer the effects of toxic stress. Understanding the adverse experiences a child has been exposed to will help us identify the therapeutic approach needed, so that together we can change the story of the child's life. [Adverse Childhood Experiences Resource Guide, 2016, pp 13]</p> <p>Traumatic experiences occur in students' lives more frequently than many of us realize. When a student experiences frequent or prolonged adversity such as physical, sexual or emotional abuse, chronic neglect, or exposure to violence, substance abuse or poverty, the stress experience can become intolerable and toxic. Toxic stress can derail healthy development and can result in trauma. This is especially true when a student has no caring adult to act as a buffer. Students who have been exposed to danger that is unpredictable and uncontrollable live much of their lives in survival mode. They respond to the world as a place of constant danger, even if the events happened months or years earlier. Trauma impacts brain development, and as a result, can affect students' ability to learn and to recognize emotions and regulate their attention and behaviour. This may result in impulsive or aggressive behaviour or the opposite, extreme withdrawal and inattentiveness. When educators understand trauma, they are less likely to view trauma-related behaviours as intentional or as stemming from a lack of motivation or laziness. This understanding will reduce punitive types of responses that can re-traumatize students. Creating safe, supportive learning environments and developing positive relationships with students who have experienced trauma plays a key role in mitigating its effects. [Trauma Informed Practice, Guide, 2016, pp 1]</p> <p>Current research clearly identifies the importance of mental health to learning, as well as to students' social and emotional development. Given the important relationship between positive mental health and academic success, schools have an important role in nurturing students' positive mental health and well-being. The goal of this resource is to help build a shared understanding of how schools, community partners and government can better work together to support mental health, to ensure that every student in Alberta has the learning opportunities and supports they need to develop positive mental health, be an engaged and successful learner and reach their full potential. [This resource includes an information tool at the end to guide work around developing a mental health strategy. [Working Together to Support Mental Health in Alberta Schools, Guide, 2017, pp. 4]</p> <p>Brains [...are...] built over time through a complex interplay between our biology and the experiences we have in childhood. The[se] experiences [...] can be thought of like the serve and return action between two people playing tennis. Babies and children "serve" by reaching out for interaction with adults through eye contact, babbling,</p>	<p>Logic: C-E and P-S rationales (early adverse experiences link to brain development and citizenship; need to develop positive relationships and recognize ACEs to identify therapeutic approaches) Formulation: Label (protective factors, adverse childhood experiences, adverse experiences, mental health), Metaphor (toxic stress, buffer)</p> <p>Logic: C-E relationship (experiences of toxic stress linked to brain development, trauma and later health and substance abuse); P-S rationale (Understanding trauma and creating positive learning environments and relationships can mitigate effects) Formulation: Label (trauma, early experiences, brain development); Metaphor (toxic stress)</p> <p>Logic: C-E (mental health linked to learning and emotional development); P-S (learning supports and opportunities can help develop positive mental health) Formulation: Label (mental health, development, well-being)</p> <p>Logic: C-E (early experiences influence brain development and health outcomes); P-S (Providing positive interactions can</p>
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		<p>facial expressions, crying and eventually through conversations and other activities; adults must return the serve by responding in a developmentally appropriate way in order to keep the action going. This back-and-forth social interaction allows babies and children to practice key skills [and...] repeated use of these skills will strengthen corresponding brain circuits and provide a strong foundation for more complex circuits to build on [and is] critically important to brain development: inconsistent, unresponsive or absent social interactions disrupt the development of neural circuits and can lead to poor learning, social and health outcomes. [Steps EMap Newsletter Spring 2018; routine publication; pp. 12]</p>	<p>facilitate healthy development) Formulation: Label (early experiences, brain development); Metaphor (brain architecture, serve and return)</p>
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TABLE 9: CASE 2 (ORIGINS) GENERAL SPEAKING TRENDS BY PHASE

Setting		Phase 1: (2007-2011)	Phase 2: (2011-2015)	Phase 3: (2015-2019)
Participants (Author→ Audience)	Alberta Health→	Policymakers	Practitioners Policymakers General Public	Practitioners Policymakers General Public
	Alberta Education→	Educators Students	Caregivers General Public	Practitioners Decision-makers
Ends		-Provide information and recommendations based on current research about origins of addiction -Guide science-based decision making and skill development -Align Albertan perceptions of addiction with science and research	-Provide information on current addiction research for improved decision making -Increase research and application to services -Guide actions and improve health of Albertans -Provide resources and strategies around types of care	-Aim to provide information about trauma informed care to improve practice -Provide recommendations and strategies for improved services -Provide recommendations on policy development -Provide action tools to improve service provision
Instruments	Context	Current research shows that drug use causes chronic brain alterations, and this should guide development of approaches to addiction in Alberta	Science and research show that addiction is a chronic brain disease rooted in early personal trauma, and Albertans ought to be concerned with providing optimal childhood experiences to reduce risk of addiction	Current research demonstrates that addiction is caused by a variety of early experiences and environments and this is important for understanding how to promote healthy brain development of Albertans
	Logic	-Drug use is correlated with problematic brain changes including effects to neurotransmitters -We need to influence expenditures on mental health by changing perceptions of personal responsibility around addiction to align with science understanding it as a personally uncontrollable brain disorder	-Negative early experiences and trauma affect brain development and are correlated with risk of addiction -We need to strengthen family connections to combat addiction in the long term -Data collection in order to bring evidence based practices and perspectives into system programming, funding and service planning	-Early struggles and trauma have lifelong health effects including addiction -We need public awareness of brain science underlying addiction -We need comprehensive and collaborative policies and services around brain development, and mental health of use -Need to promote student success and well-being via intervention activities to mitigate later addiction issues -Need to increase the age of legal use of substances to prevent early exposure to drugs and development of addiction -Need education and training for caregivers and professionals, knowledge translation and mobilization and evidence-informed practice
	Formulation	Labels: Chronic disease Brain disease Brain regions Neurotransmitters Metaphors and Similes: Roots of addiction Addiction like other chronic diseases	Labels: Trauma Trauma affect brain development Brain plasticity Early childhood development Adverse childhood experiences Brain disorder Resiliency Metaphors: Toxic stress Brain architecture Faultlines	Labels: Chronic brain disease Adverse childhood experiences Trauma Vulnerability Early childhood development Resiliency Well-being Brain plasticity Brain development Metaphors: Toxic stress Brain architecture Brain Faultlines
Genres		Information guide Learning modules Report	Resource guides Reports Routine publications Recommendations Learning Module Policy	Tool kits Routine publications Handbooks Reports Recommendations Framework Plan

TABLE 10: CASE 2 (ORIGINS) REPRESENTATIVE QUOTES by PHASE and EDITING RULES OF TRANSLATION

	AUTHOR	REPRESENTATIVE QUOTES	SUMMARY OF EDITING RULES
Phase 1 (2007-2011)	Alberta Health	<p>“[There have been] some fascinating insights into the roots of addiction. [Neuroscientists have] conducted extensive studies showing that repeated exposure to drugs—whether it’s cocaine or caffeine, amphetamines or nicotine—produce chronic alterations in brain circuitry and structure. These changes vary according to age, with the young being the most vulnerable. Once the changes occur, they are very difficult to reverse. One of [the] findings is that drugs wreak havoc with the formation of synapses—the critical connections that allow the brain to absorb and process information. The developing brain is most at risk. The formation of brain synapses actually peaks at about the age of one. From then, until about age 18, synapses are being radically “pruned,” so that we are actually losing hundreds of thousands of these connections each second. By the time we leave adolescence, the brain’s “grid”—the basic pathways that determine how well or easily we will learn new things—has been pretty much established. [...] A person’s stress level will affect their susceptibility. A pre-existing psychological condition, such as depression, may also increase the likelihood of addiction. On the other side, a person who is intellectually stimulated and has a broad range of prior life experiences is less likely to succumb to addiction than one whose lifestyle and interests are more circumscribed.” [Mending Minds, Information Supplement; 2007; pp 14]</p> <p>“... [addiction and mental health] advocates will be more effective in influencing expenditures [...] if they can change policymakers’ perceptions of the personal responsibility [...] and the ineffectiveness of mental health care interventions (Kirby Report 1, pp. 39-40) with factual information that [addiction is] caused by a “personally uncontrollable brain disorder” (Corrigan and Watson, 2003, p. 504) and is treatable like other chronic physical illnesses. [...] Research has shown “perceptions of personal responsibility to be the single greatest correlate of the values driving decisions about resource allocation.” (Corrigan and Watson, 2003, p. 504).” [How Much Should We Spend on Mental Health?; Report; 2008; pp. 31]</p>	<p>Logic: C-E relationships (drugs cause chronic brain changes); P-S (intellectual stimulation and broad range of life experiences reduce risk of addiction) Formulation: Label (chronic alterations to brain, vulnerable, susceptibility, stress, addiction); Metaphor (pruned, grid)</p> <p>Logic: C-E (addiction is caused by brain); P-S (changing perceptions can influence resource allocation decisions) Formulation: Label (addiction is brain disorder, chronic illness)</p>
	Alberta Education	<p>“Some drugs work in the brain because they have a similar size and shape as natural neurotransmitters. In the brain in the right amount or dose, these drugs lock into receptors and start an unnatural chain reaction of electrical charges, causing neurons to release large amounts of their own neurotransmitter. [...] Other drugs block reabsorption or reuptake and cause unnatural floods of neurotransmitter. [...] All drugs of abuse, such as nicotine, cocaine, and marijuana, primarily affect the brain’s limbic system. Scientists call this the “reward” system. Normally, the limbic system responds to pleasurable experiences by releasing the neurotransmitter dopamine, which creates feelings of pleasure.” [...] Drug abuse and addiction lead to long-term changes in the brain. These changes cause addicted drug users to lose the ability to control their drug use. [...] Drug addiction is a disease [...While] there is no cure for drug addiction, but it is a treatable disease; drug addicts can recover. Drug addiction therapy is a program of behaviour change or modification that slowly retrains the brain. Like people with diabetes or heart disease, people in treatment for drug addiction learn behavioural changes and often take medications as part of their treatment regimen.” [Career and Life Management Module 1: Personal Choices, Lesson 4: Drug Use and Abuse; Alberta Education; Learning Module; 2008; pp 135-136]</p>	<p>Logic: C-E relationships (Use of drugs affect limbic system and causes brain changes); P-S (addiction is treatable via drug addiction therapy) Formulation: Label (drugs of abuse, down regulation, reward system, limbic system, drug addiction is a disease); Metaphor (drug addiction like other chronic illnesses)</p>
Phase 2 (2011-2015)	Alberta Health	<p>“Addiction: A primary, chronic, neurobiological disease, with genetic, psychosocial, and environmental factors. It is characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. [...] In the context of the environmental scan, “addiction” includes the full spectrum of substance use disorders, as well as gambling addiction and other disorders of the brain.” [Mental Illness and Addictions: Alberta Research Activity and</p>	<p>Logic: C-E rationales (Addiction is associated with genetic, psychosocial and environmental factors) Formulation: Label (addiction is a neurobiological disease of the brain)</p>

		<p>Leadership Environmental Scan 2011; Environmental Scan; 2011; pp. 13]</p> <p>Cracks in the Brain, Enhancing Albertans' Understanding of the Developmental Causes of Addiction, uses the metaphor of "brain faultlines" to describe new scientific knowledge about how addictions form. Like a faultline in the earth, people's brains can develop small cracks. In some cases, faultlines appear as the brain develops. They can also develop over time as people experience toxic stress. Other times, people may have been born with faultlines. Just as faultlines in the earth's core can set off earthquakes, faultlines in the brain can affect brain architecture. This physical response is leading us to look beyond the individual to the bigger picture and to identify a whole host of possible developmental causes. Not every faultline in the brain leads to an addiction. Faultlines must be triggered to cause damage. They can also be prevented and minimized. [Special Reprint Issue Our Brains Apple Magazine; AHS & AFWI; Apple Magazine; Magazine; 2012]</p> <p>Addiction, a disease that originates in our reward and motivational systems, changes the brain's reward pathways. The metaphor of brain faultlines is used to describe new knowledge about how addictions form [...] If faultlines are set off, addictive substances or behaviours come to be seen as a part of the brain's normal operation. Our understanding of addiction's relationship to brain plasticity is still in the early stages, although researchers are learning that treatment may be able (at least in part) to counteract the brain's adaptation to an addiction, through the development of new pathways and reward systems. Our increased understanding of the brain is shedding light on why, as a society, it's important to prevent children's exposure to damaging conditions that can erode their early brain architecture. These conditions can range from disruptions in family stability to adverse childhood experiences. Our increased understanding of the brain also allows us to more effectively treat a wide range of other ailments such as stroke, brain cancer, radiation damage, autism, cerebral palsy, tinnitus, speech impediments, learning disabilities, post-traumatic stress, spinal cord injury, phantom limb pain, Parkinson's disease, multiple sclerosis and fetal alcohol spectrum disorder. [Apple Magazine Special Issue Fall 2012; pp. 65]</p> <p>"The traumatic experiences of individuals with the most serious addiction and mental health problems are usually interpersonal in nature, intentional, prolonged and repeated, occur in childhood and adolescence, and may extend over years of a person's life (Jennings, 2004). The Adverse Childhood Experiences (ACE) study is one of the largest investigations ever conducted to assess associations between childhood maltreatment and later-life health and well-being (CDCP, 2012). [...] Addiction is functionally viewed as an understandable, unconscious, compulsive use of psychoactive materials in response to abnormal early life experiences [...]. These experiences also increase the extensive range of health risks [...and ...] routine screening at the earliest possible point [is recommended] for adverse childhood experiences and a treatment focus on underlying causes. [...] Addiction is more experience-dependent than substance dependent [...] [...] Adverse Childhood Events may lead to social, emotional, and/or cognitive impairment which contributes to an individual adopting health-risky behaviors ultimately leading to disease, disability, and social problems which could end in early death. The ACE study showed that risk factors for disease, disability, and early mortality are</p>	<p>Logic: P-S rationale based on C-E relationships (experimentation with substances happens; we need to prevent associated harms amongst youth by addressing causes of drug use, not just drug use itself) Formulation: Label (problematic substance use)</p> <p>Logic: C-E and P-S rationales (Early experiences correlate with later mental health) Formulation: Label (early experiences, mental health), Metaphor (brain architecture, brain gets built step by step, building a house, foundation)</p> <p>Logic: C-E relationship (adverse childhood experiences are related to brain development disruptions and later addiction); P-S rationale (Prevention of exposure to adverse experiences can mitigate adverse effects) Formulation: Label (brain development, adverse childhood experiences); Metaphor (faultlines, brain architecture)</p> <p>Logic: C-E (early experiences of trauma can result in addiction); P-S (reducing risk factors and early routine screening can mitigate later addiction) Formulation: Label (adverse childhood experiences, well-being, addiction, risk factors)</p>
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		not randomly distributed but are directly influenced by experience.” [Trauma Informed Practice; learning module; 2013; pp 1-2]	
	Alberta Education	<p>Ad campaigns to prevent drug and alcohol abuse often target teenagers, often using hard-hitting images and dire warnings. Although the messages can be powerful, neuroscientists now say our addictive predispositions may be set by the time we are teens. “What happens in childhood is critically important in determining how vulnerable a person will be to addiction later in life,” says Dr. Nicole Sherren, a behavioural neuroscientist and scientific director for the Norlien Foundation, which is based in Calgary and Edmonton. “Addiction prevention can begin right at birth and continue across the lifespan.” A complex mix of genes and exposure to adversity in childhood can make people more likely to develop addictions. Experiences such as abuse, neglect or domestic violence cause large amounts of stress hormones to be released, which are toxic to the developing brain. [Apple Magazine Spring 2012 Issue 7]</p> <p>When it comes to addiction, new research is changing the way we think about the interaction between what we’re born with (our genes) and the lives we lead (our experiences). Addiction is a chronic condition that affects the brain’s reward and motivation systems. But well before an addiction takes hold, brain development plays a critical role in a person’s susceptibility to addiction in the first place. Early childhood experiences, as far back as the pre- and postnatal periods, can alter brain architecture in ways that may make addiction more likely. Nurturing relationships, particularly up to age six, are essential for healthy brain development. Adverse childhood experiences [...] lead to toxic stress, which can damage brain architecture, limit brain growth, hinder memory and spatial navigation skills and lower immunity to infection. Children who live through several adverse childhood experiences (ACEs) may grow up to be adults who have difficulty coping with stress and anxiety— in part because of how their brains were shaped by their experiences during this critical time. The idea that certain brains are more at risk of addiction requires a major shift in thinking, something that can be as challenging as addiction itself. The Alberta Family Wellness Initiative (AFWI) was founded by the Norlien Foundation to give Albertans “a common framework of understanding” about leading-edge The AFWI works with the Washington, D.C.-based FrameWorks Institute, a non-profit organization that helps translate science and research into everyday language. [Special Issue Our Brains Apple Magazine; AHS & AFWI; Apple Magazine; Magazine; 2012]</p> <p>“By kindergarten, more than one in four children are developmentally vulnerable, says the study, citing Early Development Instrument (EDI) Canada-wide results. Children who struggle in kindergarten are more likely to fail in school. As adults, they are more likely to experience poor physical and mental health, addictions, and difficulties in personal relationships and in finding well-paying, skilled jobs.” [Steps EMap Newsletter 2012; routine publication; AB Education; pp 3]</p>	<p>Logic: C-E (childhood experiences are linked to vulnerability to addiction); P-S (early prevention can mitigate negative early experiences and later addiction) Formulation: Label (early experiences, addiction, stress)</p> <p>Logic: C-E (early experiences affect brain development and are linked to toxic stress addiction); P-S (healthy relationships can mitigate, need to shift ways of thinking about addiction) Formulation: Label (early childhood experiences, adverse childhood experiences, susceptibility, brain development, addiction); Metaphor (toxic stress, brain architecture)</p> <p>Logic: C-E (children who struggle academically are more likely to experience addiction) Formulation: Label (vulnerable, addictions)</p>
Phase 3 (2015-2019)	Alberta Health	<p>“Understanding rather than punishing Addiction is a brain disease that is more likely to affect people who have had three or more adverse childhood experiences (see page 43). “Addicts are ostracized, shamed and they’re told they’re bad people, and when they try to treat their pain, we jail them,” said Dr. Gabor Mate, a Canadian physician and author specializing in addictions, in a recent interview with CBC Radio. “We traumatize them further by sticking them in jail.” Treating addiction as a brain disease removes the notion that it’s somehow a conscious choice, adds Flatters. “If you see addiction as a choice, you punish people. But if you see it as a disease—you wouldn’t punish someone for having cancer or diabetes—you respond like you would to any other disease: what’s the plan, what if there’s a relapse?” she says. “And you provide effective, efficient and responsive intervention very early to break those intergenerational cycles of addiction.” In his Calgary courtroom in the fall of 2013, Carruthers’ weighed the science-based evidence about toxic stress and early brain development</p>	<p>Logic: C-E (adverse childhood experiences are linked to addiction); P-S (treating addiction as brain disease can act as intervention) Formulation: Label (addiction as brain disease, chronic disease, early brain development); Metaphor (toxic stress)</p>

	<p>as he decided whether to return a baby girl to her mentally ill, homeless mother. In his judgment he drew on expert evidence from Evelyn Wotherspoon, a clinical social worker and early childhood mental health consultant. “The child,” Carruthers wrote, “is in a period of exuberant brain growth, she is vulnerable to disruptions in that growth through exposure to toxic stress.” Adoption, he decided, was in the baby’s best interests.” [Apple Magazine Special Issue Our Brain; AHS & AFWI; Magazine; Spring 2015]</p> <p>“Addiction [is a] chronic and complex disease that affects a person’s ability to control their dependency on a substance (such as alcohol, tobacco or drugs) or a behaviour or process (such as gambling, gaming, shopping or pornography). The Canadian Mental Health Association describes addiction as the presence of the 4 Cs: craving, loss of control of the amount or frequency of use; compulsion to use; use despite consequences. Adverse childhood experiences (ACEs), negative experiences such as severe neglect, abuse or household dysfunction that can weaken the foundation of a child’s brain. [...] The foundation for learning, behaviour and health, brain architecture is like building a house—it starts with the foundation and develops in an orderly sequence. Brains are built over time, from the bottom up, with the most intense development in the early years. A strong foundation in the early years increases the chances of having a healthy life and stable relationships. A weak foundation increases the risk of problems later in life. [...] What we’ve learned in neuroscience in the past 40 or 50 years is that the brain has that capability to be plastic, the capability to be changing. [...] It’s really a profound statement because it means addiction is a brain disorder and recovery is a brain recovery.” [Our Brain Your Guide: The Story of Childhood Development; AHS Apple Magazine; Magazine; 2015; pp 35]</p> <p>“With complex problems come complex solutions, and therefore the recommendations in this report target a number of areas with the underlying intent that access, availability of programming, coordination, and in some cases integration of these services, will be what makes the difference for Albertans struggling with these issues. As a province, we can take a leadership role and recognize the importance of having a system that is responsive to the needs of Albertans. As individuals, we can make mental health a priority and support others who struggle to attain it. If there is one message to take from this report, it is that nothing will change unless we ourselves change and decide to take action. [...] [We recommend the creation] of public awareness opportunities and programs to enable people to support their own mental health and the health of those they care about through collaboration between the Government of Alberta and non-government organizations including: a. Educating the public on brain development, and risk and protective factors related to addiction and mental illness; and b. Supporting individuals to develop skills to engage in conversations that reduce stigma and direct people to help.” [Valuing Mental Health; Report; 2015; pp 7; 22]</p> <p>“[Regarding a]ge of use [...r]esearchers and public health organizations are in agreement—there is no safe age for using cannabis. Delaying use is one of the best ways to reduce the risk of harm to the developing brain. Scientifically-based minimum age recommendations are generally early-to-mid-20’s but also recognize that a public health approach includes consideration for balancing many variables related to enforcement, the illicit market and public acceptance. Some public health organizations recommend the minimum age be set at 21 and others recommend bringing alcohol, tobacco and cannabis in alignment. Experience with tobacco has shown that there is a higher impact on initiation by persons under 15 and age 15-17 when setting the minimum age of purchase and possession at 21 versus 19 (Institute of Medicine in US). With the U.S. states who have legalized cannabis, all have chosen age 21 for cannabis minimum age and three states and over 230 cities/counties have implemented age 21 for tobacco. Cannabis legalization represents</p>	<p>Logic: C-E (early negative experiences can alter brain development and cause addiction); P-S (strong early foundations can facilitate healthy development and reduce risk of addiction) Formulation: Label (adverse childhood experiences, addiction, brain plasticity, recovery); Metaphor (brain architecture, foundation)</p> <p>Logic: C-E (early brain development is related to addiction); P-S (education, support, access to services and skill development can help to address addiction) Formulation: Label (brain development, stigma, mental health, addiciton)</p> <p>Logic: C-E (drugs influence brain development); P-S (delaying use of drugs can reduce risk of harm and addiciton) Formulation: Label (harm to developing brain)</p>
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	<p>an opportunity for Alberta to consider raising the tobacco and alcohol minimum age.” [Public Health Perspectives on Cannabis Legalization in Alberta; AHS; Recommendation; 2017; pp 4]</p> <p>“Like all behaviours, addiction is influenced by brain development. The environments we are exposed to as children, particularly exposure to toxic stress, even prenatally, can cause brain architecture to develop in ways that shape how vulnerable we are to addiction. While significant advancements have been made to understand the nature of addiction, a good deal of work remains to be done. In 2010, the Alberta Family Wellness Initiative (AFWI) of the Palix Foundation partnered with Alberta Health Services and the Government of Alberta to better understand the link between early brain development and addiction. The AFWI’s Sharing the Brain Story report shows the challenges of developing substance use policies: [R]esearch, policy, and practice depend upon public awareness, perception, and support. But while scientific knowledge about early childhood development, child mental health, and addiction has advanced dramatically in recent years, very little of this knowledge has percolated into public discourse. The public still has foggy, often misguided, notions of how the brain develops; what, if anything, can be done to promote healthy development; and who is responsible for doing it. Likewise, underdeveloped notions about the nature of addiction and what causes it restrict how the public and policymakers think about what can be done to address the problem and who is responsible for doing it. In addition to understanding early brain development and its influence on mental health and substance use outcomes, we must support holistic approaches to truly make progress on this front. Dr. Gabor Mate illustrates this point concisely: We need to avoid the trap of believing that addiction can be reduced to the action of brain chemicals or nerve circuits or any other neurobiological, psychological or sociological data. A multileveled exploration is necessary because it’s impossible to understand addiction fully from any one perspective, no matter how accurate. Addiction is a complex condition, a complex interaction between human beings and their environment. Addiction has biological, chemical, neurological, psychological, medical, emotional, social, political, economic and spiritual underpinnings. Addiction is “all about” many things.” [Community Drug Strategy; Strategy; 2018]</p> <p>Policing is a complex job that requires continuous and specialized training. That’s why the Calgary Police Service is making the Alberta Family Wellness Initiative’s (AFWI) Brain Story part of basic training for its new recruits. The online course is free and includes 30 hours of instruction on how early brain development influences our mental and physical health throughout life. “What I’m hoping we’ll see over the next year is it’s fully embedded in our recruit curriculum,” says Calgary Police Chief Roger Chaffin. The veteran officer is one of nearly 200 Calgary officers who have taken the course. He explains how the science of brain development is a powerful lens for understanding what drives people to addiction or criminal behaviour. “We start to understand that it’s not a choice to behave the way that they do; it’s not simply a weakness of character that they have gone down this road,” Chaffin says. “The brain story helps us understand that from a more foundational level.” [Apple Magazine Winter 2018 Issue 32; 2018; pp.]</p> <p>“Alberta Health, in partnership with Indigenous, community, cross ministry and service delivery partners is leading implementation of Valuing Mental Health: Next Steps, which outlines 18 actions to improve the addiction and mental health system in Alberta. Action 11 addresses raising awareness about adverse childhood experiences within the context of brain and child development, including the importance of the early years and inter-generational trauma, which are risk factors for mental health concerns and substance abuse later in life. A framework for action to fulfill this action is being finalized with areas of focus including education and training for caregivers and</p>	<p>Logic: C-E (early experiences and environments is linked to brain development and addiction); P-S (need to align public discourse with science) Formulation: Label (addiction, brain development, vulnerable, early childhood development, substance abuse, brain development); Metaphor (brain architecture)</p> <p>Logic: C-E (brain development is linked to addiction and criminal behaviour); P-S (understanding what drives addiction influences how we treat it) Formulation: Label (brain development, addiction); Metaphor (brain architecture, brain story)</p> <p>Logic: C-E (early experiences of trauma are risk factors for addiction); P-S (education and training can facilitate evidence-informed practices to improve addiction system)</p>
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		professionals, knowledge translation and mobilization and evidence-informed practice. [Into Focus: Calling Attention to Youth Opioid Use in Alberta. AB Health, Response to Office of Child and Youth Advocate Investigative Review; 2018; pp 6]	Formulation: Label (adverse childhood experiences, addiction, brain development, trauma, risk factors)
Alberta Education	<p>Addiction is defined as a primary, chronic, neurobiological disease, with genetic, psychosocial and environmental factors that contribute to its development. It is characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm and craving (Government of Alberta, 2011). [...] The consequences of these mental health and addiction problems have a significant impact on the student experience in higher education. Academic success is increasingly being linked to mental health and wellbeing. Literature shows that student mental wellbeing is an indicator of academic achievement, learning and retention (Gray & Hackling, 2009; Ansari & Stock, 2010). Mental health and addiction problems can lead to student drop-out, isolation, increased substance use, poor sleep quality and thoughts of suicide (Keyes et al., 2012; Reavley & Jorm, 2010; American College Health Association, 2013). Given these links, it is important for post-secondary institutions to be aware of effective strategies to promote student mental health and wellbeing.</p> <p>[Alberta Post-Secondary Student Mental Health; 2015; Guide; pp.]</p> <p>“Take a few minutes to watch the video, The Core Story. It shares with you a group of scientific facts establishing the link between early brain and biological development and the later development of lifelong health outcomes including mental health problems and addiction. The core story covers numerous topics, touching on early experiences, brain plasticity, children’s mental health and the concepts of toxic stress.” [Handbook for Parents Kindergarten Education Program; March 2016; pp 9]</p> <p>“Post-secondary institutions are complex and dynamic environments with great potential to impact the mental health of students, faculty and staff who live, learn and work within them. Previous approaches to addressing student mental health and addiction problems focused primarily on individualized interventions to treat individual problems like anxiety and depression. While effective interventions are critical for students experiencing these problems, there is a growing acceptance of the impact of the whole campus environment on student mental wellbeing and functioning. Many universities and colleges across Canada and worldwide are beginning to develop comprehensive policies and services to address mental health and addiction problems on campus (MacKean, 2011). These multi-level initiatives are shifting the focus to the multitude of factors that play a role in student mental health and wellbeing. Some of these factors include: supporting students with psychosocial disabilities; staff and faculty development and support; appropriate funding and resources; good policy development; stigma reduction efforts; and inclusive environments (Warwick et al., 2008). Many more examples are provided in the Post-Secondary Student Mental Health: Guide to a Systemic Approach document.” [Alberta Post-Secondary Mental Health and Addiction Framework; 2015; framework; AB EDUC; pp 8-9]</p> <p>“Students who have been impacted by toxic stress are at a much higher risk for later physical and mental health problems, including developing a mental illness such as depression, anxiety or addiction. These adverse experiences present barriers to high school completion. For more information on ACEs, toxic stress and their impact on youth development, see the video How Brains Are Built: The Core Story of Brain Development, or visit the Alberta Family Wellness Initiative website at www.albertafamilywellness.org. Vulnerability predictors like having higher risk factors, limited protective factors or high incidence of ACEs, offer us some insight about which students may</p>	<p>Logic: C-E (academic success is linked to addiction); P-S (effective strategies to promote student well-being are needed to address this relationship)</p> <p>Formulation: Label (addiction, well-being, drug use)</p> <p>Logic: C-E (early development is linked to later addiction)</p> <p>Formulation: Label (early brain development, addiction, early experiences, brain plasticity); Metaphor (toxic stress)</p> <p>Logic: C-E (academic success is linked to addiction); P-S (effective multi-level interventions to support student well-being can help to mitigate this relationship)</p> <p>Formulation: Label (addiction)</p> <p>Logic: C-E (adverse experiences of toxic stress are linked to later addiction issues); P-S (caring relationships can help to mitigate)</p> <p>Formulation: Label (addiction, adverse childhood experiences, protective factors, brain development,</p>	

		need proactive support in completing high school. But it is imperative to note that vulnerability can happen to any student at any time. For this reason, caring relationships between the adults in schools and the students within it are essential. Any student at any time can become at risk for not completing high school. Intentionality around caring relationships with students creates greater likelihood that a student at risk will be noticed and supported." [Supporting High School Completion: A Tool Kit For Success; 2017; pp 2]	vulnerability, risk); Metaphor (toxic stress, brain architecture)
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TABLE 11: CASE 3 (CONCURRENT) GENERAL SPEAKING TRENDS BY PHASE

Setting		Phase 1: (2006-2011)	Phase 2: (2011-2015)	Phase 3: (2015-2019)
Participants (Author→ Audience)	Alberta Health→	Practitioners Policymakers Educators Researchers	Policymakers Practitioners	Practitioners Policymakers
	Alberta Education→	Educators	Educators General public/ Caregivers	Educators
Ends		-Provide directives for service improvement -Provide information and venues for collaboration -Provide recommendations for strategy implementation -Provide information on current research and for skill development -Develop strategic priorities	-Guide actions to improve health of Albertans and reduce prevalence rates of concurrent disorders -Provide information to guide decision making -Provide information and resources for intervention and treatment strategies based on models of best practice	-Evaluate and critique existing services -Provide information and make recommendations to guide policy development
Instruments	Context	Research shows significant interplay of addiction and mental health issues in Alberta, but understanding of the neurological mechanisms understanding this relationship is lacking	Evidence shows that some Albertan populations are more vulnerable to addiction due to the neurocircuitry associated with particular brain regions associated with risk-taking and mental health problems	Understanding the research behind mental health is important for policy development and service provision in Alberta
	Logic	-Addiction and mental illness are highly correlated -People with concurrent disorders present specific care challenges -Concurrent disorders are treated separately and this is detrimental to patients -Need integrated care, collaboration, public awareness and better models to address concurrent issues -Need further research to understand neural mechanisms underlying concurrent disorders	-Addiction and mental health issues are highly correlated due to similar underlying neural pathways -Difficult to understand whether addiction or mental illness comes first -Treatment services need to be integrated to address and meet client needs -In order to meet the needs of vulnerable and at-risk populations, we need to understand the research linking brain development, trauma and concurrent disorders	-Mental health and mental illness includes addiction issues -We need to integrate understandings about mental health and mental illness from research in order to develop implement appropriate policies
	Formulation	Labels: Concurrent disorders Harm reduction models Co-occurring disorders Complex needs Co-existing disorders Comorbidity Dual diagnosis Metaphors: Silos	Labels: Concurrent disorders Complex needs Co-occurring disorders Comorbidity Co-disease	Labels: Mental health, including addiction Mental illness
Genres		Plan Information supplement Recommendation Literature review Learning modules Strategy	Strategy Routine publication Tool Kit Recommendation Guideline	Reports Recommendations

TABLE 12: CASE 3 (CONCURRENT) REPRESENTATIVE QUOTES by PHASE and EDITING RULES OF TRANSLATION

	AUTHOR	REPRESENTATIVE QUOTES	SUMMARY OF EDITING RULES
Phase 1 (2006-2011)	Alberta Health	<p>“People with mental illnesses who also have substance abuse or addictions problems present a specific challenge in terms of treatment and care. AADAC should continue to act as the primary government agency charged with providing addictions services within the health regions. [...] The implementation of AADAC services for any regional health authority should be based on local needs and planned at the local level utilizing formal structures that effectively engage regional health authorities and other relevant stakeholders. AADAC should be responsive to the unique service needs of the regional health authorities and plan and deliver programs that are tailored to those needs. [...]” [Advancing the Mental Health Agenda: A Provincial Mental Health Plan for Alberta; Plan; April 2004; pp 46]</p> <p>“Why so much talk about substance abuse at an event meant to highlight mental health research? The reasons are two-fold. The first is that large numbers of people with mental illness also struggle with substance abuse. The second is that the two fields, mental health and addiction services, have traditionally operated in their own silos—often to the detriment of patients who suffer from what is commonly referred to as “concurrent disorders.” There is now almost universal agreement that this must end. There is less consensus on how this can be done.” [Mending Minds; Information supplement; 2007; pp 12]</p> <p>“Concurrent disorders AADAC and RHAs share responsibility for concurrent disorders People with concurrent disorders have a mental illness combined with an addiction problem. This is very common; study after study shows that roughly half of those with a mental illness have an addiction problem and vice versa. Alberta, unlike most provincial jurisdictions in Canada, separates the mental health and addictions mandates. The Alberta Alcohol and Drug Abuse Commission (AADAC), an Alberta government agency, has the lead in formulating concurrent disorder policy in the province. Ideally, concurrent treatment should be simultaneous The mental health problems of people with concurrent disorders often exacerbate their addiction problems, and vice versa. For example, a depressed person may take street drugs to combat his depression; these drugs ultimately make him more depressed. Mental health and addiction treatments should ideally take place simultaneously rather than sequentially.” [Report of the Auditor General of Alberta; Report; October 2008]</p> <p>“Very recent review articles on the topic also confirm the association of suicidality with concurrent disorders. Spirito et al. (2006) lists comorbidity as a major risk factor for all of serious suicidal behavior, attempts, and completions in adolescents. Depression and SUDs (especially cannabis and alcohol) and DBDs were implicated: There is evidence that a pattern of heterotypic comorbidity (internalizing and externalizing diagnoses) is particularly risky for completed and attempted suicide. [...] Comorbidity has also been shown to increase the risk for attempted suicide. Risk levels estimated across multiple studies were 3 to 17 times for those with comorbid disorders compared with single disorders; the article also discusses possible neurobiological mechanisms that mirror those discussed previously for concurrent disorders. Galaif et al. (2007) also review the evidence overall and reports on a startling statistic from suicide research in New Zealand that 90% of suicidal youth were depressed and/or had an SUD.” [...] [Concurrent Substance Use and Mental Disorders in Adolescents; Review; 2009]</p> <p>“In addition to the problems directly associated with gambling, many problem gamblers often have co-existing mental health or substance</p>	<p>Logic: C-E (people with concurrent disorders are associated with treatment and care challenges); P-S (primary government agency should provide tailored services based on local needs) Formulation: Label (people with mental illness and substance abuse or addictions problems)</p> <p>Logic: C-E (large numbers of people suffer from concurrent disorders); P-S (need integrated care in order to address) Formulation: Label (concurrent disorders); Metaphor (silos)</p> <p>Logic: C-E (high prevalence of people with concurrent disorders and addiction and mental health disorders often exacerbate each other); P-S (treatment should be simultaneous) Formulation: Label (concurrent disorders)</p> <p>Logic: C-E (neurobiological mechanisms explain concurrent disorders) Formulation: Label (concurrent disorders, comorbidity)</p> <p>Logic: C-E (prevalence of concurrent disorders is high,</p>

		<p>use issues. When a person has two or more disorders, this is called co-morbidity (Petry, 2005). The disorders may occur independently, which would be considered lifetime co-morbidity, or they may occur at the same time, which is known as current co-morbidity (Petry, 2005). Co-morbidity is often considered to be a more general term that is used in the medical field, whereas the term concurrent disorder has been primarily used by psychiatrists to specifically refer to the co-existence of a mental disorder and an addiction problem related to substance use or gambling (Currie, n.d.). It has been suggested that “co-morbidity” be used to describe co-occurring non-addictive mental health disorders (e.g., depression and panic disorder), whereas “concurrent disorder” would refer to a mental health and addiction problem (e.g., depression and gambling) (Currie, n.d.). When the disorders co-occur, it is often difficult to understand which problem came first, and whether one caused the other. It is also often difficult to ascertain whether providing treatment for one condition would subsequently cause improvements in the co-existing condition. These are important questions that have yet to be fully answered in the research literature.” [Problem Gambling, Mental Health and Suicide; AHS; Review; August 2009; pp 14]</p> <p>“Very recent review articles on the topic also confirm the association of suicidality with concurrent disorders. Spirito et al. (2006) lists comorbidity as a major risk factor for all of serious suicidal behavior, attempts, and completions in adolescents. Depression and SUDs (especially cannabis and alcohol) and DBDs were implicated [...]. Comorbidity has also been shown to increase the risk for attempted suicide. Risk levels estimated across multiple studies were 3 to 17 times for those with comorbid disorders compared with single disorders; the article also discusses possible neurobiological mechanisms that mirror those discussed previously for concurrent disorders. Galaif et al. (2007) also review the evidence overall and reports on a startling statistic from suicide research in New Zealand: that 90% of suicidal youth were depressed and/or had an SUD.” [Concurrent Substance Use and Mental Disorders in Adolescents; Review; 2009; pp 210]</p> <p>“The interplay between mental health and addictions is significant. For example, over 50 per cent of adolescent patients seen in psychiatric clinics use substances; and people with anxiety disorders are two to five times more likely to have a problem with drugs or alcohol. Further research is needed on how the two disorders co-occur and are intertwined through neurological mechanisms and how they can be treated using an integrated and unified approach.” [Alberta’s Health Research and Idea Strategy; AB Ministry of Health and Wellness & Ministry of Advanced Education and Technology; Strategy; August 2010; pp 24]</p> <p>“Despite the huge impact on individuals and the economy, investments in mental health and addiction research have been small in comparison with investments in other health issues. Progress in neuroscience research has allowed for new interventions and the broad range of allied health professionals who work with patients have helped to translate new knowledge into better care. However, there is a significant need for additional research into the underlying causes, diagnoses and treatments for mental health issues and substance use disorders, as well as increasing awareness, understanding and public policy initiatives so that more people get the treatment and support they need.” [Alberta’s Health Research and Innovation Strategy; AB Ministry of Health and Wellness & Ministry of Advanced Education and Technology; Strategy; 2010; pp 24]</p>	<p>but it’s difficult to understand whether one caused the other) Formulation: Label (co-existing mental health or substance use issues, co-morbidity, co-occurring disorders, concurrent disorders)</p> <p>Logic: C-E (there is an association of suicide with concurrent disorders, concurrent disorders possibly account for concurrent disorders) Formulation: Label (concurrent disorders, comorbidity)</p> <p>Logic: C-E (concurrent disorders are intertwined through neurological mechanisms); P-S (need more research to understand this relationship and how to treat in integrated way) Formulation: Label (co-occurring disorders)</p> <p>Logic: C-E (explanations from neuroscience explain addiction and mental health disorders); P-S (additional research is needed to understand causes, diagnoses and treatments and how to treat and support patients) Formulation: Label (mental health and substance use disorders)</p>
	Alberta Education	When AD/HD is left unidentified or untreated, an individual is at greater risk for difficulties in the future, including: impaired learning ability; dropping out of school; social problems; relationship difficulties; substance abuse; career difficulties; legal and financial problems. Medication and behaviour interventions are evidence-based	Logic: C-E and P-S rationales (If AD/HD not treated, can also have other issues including substance

		<p>treatment approaches that have been subjected to rigorous research or trial and their positive effects in treating the symptoms of AD/HD have been validated. [...] Research indicates that individuals with untreated AD/HD are at greater risk to self-medicate with drugs and alcohol. Appropriate use of stimulant medication reduces this risk. [Grades 1-12 Focusing on Success: Teaching Students with Attention Deficit/Hyperactivity Disorder; AB Education; 2006; Resource]</p>	<p>abuse; need to treat using evidence based approaches) Formulation: Label (substance abuse and AD/HD, co-occurring disorder; co-existing disorders)</p>
Phase 2 (2011-2015)	Alberta Health	<p>“The high prevalence of concurrent disorders in mental health and addiction settings means that we should consider people coming into service with both these disorders as the expectation and not the exception. When an individual experiences both a mental health disorder and a substance use disorder at the same time, these problems influence each other in their development, their severity, their response to treatment and their relapse circumstances. If a health-care provider attempts to treat either disorder without recognizing and responding to the concurrent disorder, the treatment is likely to be less effective. The capacity of a system to organize concurrent-capable services as a minimum standard is critical to strengthening the efficiency and efficacy of service delivery to the addiction and mental health population.” [Enhancing Concurrent Capability; 2013; Toolkit; pp. 5]</p> <p>“There is also evidence that youths are more vulnerable to addiction than adults because the neurocircuitry associated with motivation, impulsivity and addiction is still under development during adolescence. [...] This research indicates that the same neurological changes associated with novelty-seeking, risk-taking and reduced inhibitions during adolescence also make teens more vulnerable to addiction than adults or children. Tobacco use may be a particular problem in young people with mental health or behavioural problems. Prevalence rates among youths are significantly higher among those with conduct disorder (30%), emotional disorders (19%), and attention deficit hyperactivity disorder (ADHD – 15%), compared to those without such disorders (5%). Both depression and ADHD are considered risk factors for tobacco use.” [Tobacco Free Futures Guidelines; Chapter 21 Specific Populations: Youth and Family; AHS; Guidelines; 2014; pp 21]</p> <p>There is no one reason why people with mental illness are more prone than others to problem drinking or dependence on alcohol. Each person is unique, the result of a complex interaction between genetic and biological factors, personality and social environment. Nonetheless, a variety of theories have been advanced to explain the strong relationship between mental illness and problem drinking. [...] One theory [...] suggest[s] that the neurological basis of mental illness may be very similar to that of alcohol dependence. For example, the malfunctioning of certain brain circuits associated with learning—specifically the one connecting the amygdala, hippocampus and cingulate cortex—might be a factor in both mood disorders and drinking problems. Other research has shown a relationship between [...] psychotic disorders and alcohol dependence may both arise from changes to the brain caused by glutamate. [...]his shared neurobiological basis means that the same treatment and prevention strategies could be used both to improve mental health and to reduce alcohol dependence. A combined therapeutic approach would treat the mental illness and the drinking problem at the same time. In addition [...] the secondary consequences of stress related to serious family problems during childhood, poor parental supervision or child abuse at a very young age could increase the risk not only of addiction problems, but also of mood, anxiety and personality disorders, particularly impulse-control disorders. [...] [Alcohol and Mental Illness; Resource Guide; 2014; pp. 7]</p> <p>“According to the Centre for Addiction and Mental Health, concurrent disorders is defined as a situation in which a person has both a mental</p>	<p>Logic: C-E (concurrent disorders are influenced by one another) P-S (to address relationship between early experiences and later mental health, we need to provide access to continuum of services) Formulation: Label (concurrent disorder)</p> <p>Logic: C-E (same neurological changes associated with risk-taking, impulsivity, mental illness and addiction); P-S (we need targeted interventions to promote better outcomes) Formulation: Label (early experiences, mental illness), Metaphor (toxic stress, coaching)</p> <p>Logic: C-E (no one reason why addiction and mental illness are correlated, but common neurology can explain); P-S (a combined therapeutic approach can address concurrent disorders) Formulation: Label (mental illness and alcohol dependence)</p> <p>Logic: C-E (no one cause of concurrent disorders); P-S</p>

		<p>health disorder and a substance use disorder. A person who has a mental health disorder has a greater chance of developing a substance use disorder, and a person with a substance use disorder also has a greater chance of concurrently developing a mental health disorder. Some examples of concurrent disorders are: an anxiety disorder and a drinking problem; depression and dependence on sleeping pills. There is no one cause of concurrent disorders. Rather, there are many combining factors that explain why someone might develop both a mental health and a substance use problem (e.g., biology, or physical or emotional trauma). Substance use can also influence the development of concurrent disorders in the following situations: A person may use a substance to make their mental health issue feel better, help them forget about their problems or relieve symptoms in the short term. This is sometimes referred to as self-medication. Substance use can also induce or mimic symptoms of a mental health problem, including depression, anxiety, impulsivity and hallucinations. Because concurrent disorders can include a broad range of mental illnesses and substance use, there is no one single symptom common to all combinations. It may be more helpful for employers to try to recognize the symptoms of substance use and then look for mental health problems (e.g., depression and anxiety).” [It’s Our Business; Manual; 2013; pp 123]</p> <p>“Clients with complex needs may have addiction and/ or mental health challenges, addiction and behavioural challenges, and health problems with addiction and/or mental health challenges. Examples of groups of clients that are sometimes included within this service priority include: people with fetal alcohol spectrum disorder (FASD), developmental disorders, acquired and neurodegenerative brain injury, and autism; clients with concurrent disorders – mental health, complex health needs, addiction and severe behavioral challenges; children in care and children, as witnesses of family violence, who have complex needs; persons involved within the justice system including corrections (e.g., those involved with the Integrated Justice Services Project); and seniors with complex health needs and addiction and/or mental health challenges.” [Creating Connections: Alberta’s Addiction and Mental Health Strategy; AHS & Government of Alberta; Strategy; September 2011; pp 27]</p>	<p>(employers should recognize substance use and then look for mental health issues) Formulation: Label (concurrent disorders)</p> <p>Logic: C-E (clients with concurrent disorders have complex needs) Formulation: Label (addiction and/or mental health challenges, complex needs)</p>
	Alberta Education	<p>“An interesting fact is that 30% of people diagnosed with mental illness will also have a substance use disorder. When people have both we call it a concurrent disorder. It is often difficult to predict why or if someone with a mental illness will use drugs. Sometimes a person who has a mental illness will try a substance as a way to relieve symptoms of their mental illness; other times the use of a substance for whatever reason might cause the mental illness. It is important to be aware of this because regardless of how either disorder started, a person will need treatment for both disorders.” [Mental Illness and Suicidal Behavior: Mental Health Kit (Junior High School) – Be Kind to Yourself and Others, Grade 8; AHS Edmonton Zone & Edmonton Catholic Schools & Edmonton Public Schools; Tool Kit; 2012; pp 135]</p>	<p>Logic: C-E (it is difficult to explain why concurrent mental health and substance use disorders are connected); P-S (patients with concurrent disorders will need treatment for both disorders) Formulation: Label (concurrent disorder)</p>
Phase 3 (2015-2019)	Alberta Health	<p>Throughout this report addiction and mental illness refers to those suffering from: addiction issues; mental health issues; and both addiction and mental health issues at the same time. [Valuing Mental Health; Review; 2015; pp 5]</p> <p>For those in need, the only thing that matters is that they are supported and able to access services. [...] However, [...] addiction and mental health services are not always readily available. Even when they are, individuals may not have the skills to navigate the system – especially when on their own or hampered by addiction or mental illness. As a result, they may not get the care they need. The challenge is to find a point of entry to services and a path to recovery. This path often requires the development of a long-term supportive relationship rather than short-term or sporadic care. This path can be even more difficult</p>	<p>Formulation: Label (both addiction and mental health issues)</p> <p>Logic: C-E (people with both addiction and mental illness can find pathway to care difficult); P-S (centralized navigation system can help this issue) Formulation: Label (individual with both</p>

		<p>to travel if an individual has both addiction and mental health issues. A centralized navigation system would help individuals and their loved ones get the help they need. [...] Ideally, those at risk would be identified early through screening services in their own communities. An emphasis on prevention and promotion would foster wellness, early intervention and reduce incidents of addiction and mental illness later in life. It would also reduce the stigma association with these issues and increase understanding of the root causes of mental illness. [...]</p> <p>With the right supports and further partnerships with the community, these providers could more confidently deliver services earlier to those experiencing addiction and mental health issues, as well as link people to specialized or culturally responsive community-based supports. The approach used in Canterbury, New Zealand, to integrate health and social care could serve as a model to plan and deliver coordinated care across Alberta. [Valuing Mental Health; Review; 2015; p. 14]</p> <p>“Little is known about what actually causes neurological disorders — a problem the Behavioural Research Unit (BRU) at Alberta Children’s Hospital (ACH) is urgently addressing by studying how we diagnose and intervene in ADHD and other pediatric developmental, behavioural and emotional disorders. [...] These disorders are related and frequently co-occur, so it’s important to consider how another condition can cause difficulties and require support. [...] It’s a challenge to understand what the main problem is, but we’re getting better at looking at the whole child when considering how to intervene. [...] Researchers [are] are hoping to identify gene and neural biomarkers for underlying brain abnormalities that could explain cognitive, behavioural and even physical differences among children with co-occurring developmental disorders [and...] use neuroimaging to better understand how the brains of children with ADHD and co-occurring disorders [...] differ structurally from the brains of typically developing children. [...] [Department of Pediatrics Annual Report 2015: Serving Today. Building Foundations for the Future; AHS & University of Calgary; February 2016]</p> <p>Research and evidence related to cannabis-impaired driving, brain development, dependence, mental health, chronic diseases (respiratory and cardiovascular), co-disease, co-occurring other drug use, passive exposure to smoke, among other issues, should also be considered in the development of cannabis legislation and regulation. Some specific evidence includes: Brain development –evidence suggests using cannabis in early adolescence can cause adverse effects to the developing brain and are at greater risk for long term cognitive impairments. [...] While more research is needed in this area, there are reports that early, regular use is associated with higher risk of dependency, higher risk of health harms, and low levels of educational attainment. [...]. Dependence –The risk of dependency is a concern. It is reported that the global burden of cannabis dependence was 13.1 million people in 2010 (0.20%), and that dependence is greater among males and more common in high-income areas (compared to low-income areas). [...] In addition, researchers In the U.S. indicate that the prevalence of lifetime dependence is approximately 9% among people that had used cannabis at least once.</p> <p>[AHS Recommendations–Municipal Cannabis Regulations; February 20, 2018] AHS Recommendations on Cannabis Regulations for Alberta Municipalities]</p>	<p>addiction and mental health issues)</p> <p>Logic: C-E (neurological disorders frequently co-occur); P-S (research can identify neural abnormalities underlying disorders)</p> <p>Formulation: Label (co-occurring disorders)</p> <p>Logic: C-E (co-occurring drug use and mental health is related to cannabis dependence); (need to consider research in cannabis legislation)</p> <p>Formulation: Label (co-disease, co-occurring other drug use)</p>
	Alberta Education	<p>Poor mental health [can occur] without mental illness. For example, individuals respond to challenging life situations (such as relationship breakdowns, job loss, etc.) with unhealthy behaviours such as substance abuse, social withdrawal or extreme anxiety. Other individuals may develop persistent negative thinking patterns (such as distrust of others, low self-confidence) that impede their ability to maintain healthy relationships, function independently or enjoy life. [...] Mental health is not the absence of or the opposite of mental illness. For example, a person could have a mental illness, but because</p>	<p>Logic: C-E (poor mental health is associated with substance abuse); P-S need strong social network and effective interventions)</p> <p>Formulation: Label (mental health, mental illness, substance abuse)</p>

		<p>they have the support of family and a strong social network, coupled with effective interventions such as medication and counseling, they could experience positive mental health and be able to handle day-to-day challenges, maintain relationships and enjoy life. On the other hand, an individual may not have a diagnosed mental illness but may experience poor mental health as a response to stressful life events (such as relationship breakdowns or academic failure) without the benefit of a supportive social network. Over time, these individuals may also develop negative thinking patterns that impede their problem-solving abilities. Evidence of poor mental health might include difficulties maintaining healthy relationships, coping with daily stress and managing feelings of fear or anxiety. [Working Together to Support Mental Health in Alberta Schools; Resource Guide; 2017; pp. 10]</p> <p>As the emphasis of the mental health systems shifts from treatment to recovery, and mental illness becomes less stigmatized, language and definitions regarding mental health and mental illness are evolving. [...M]ental health and illness [are] dual continuums such that one could be in good or poor mental health, independently of whether one does or does not have a mental illness. In this context, mental health is “a state of well-being in which the individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.” Effective post-secondary mental health approaches create inclusive environments in which all students have the opportunity to perform academically during their post-secondary tenure, and establish life-long resilience and coping skills that contribute to fulfilling careers and lives long after students conclude their post-secondary education. [...] In addition, the Advisory Panel considered the scope of mental health to be broad, encompassing addiction. The Panel understood addiction as the full spectrum of substance use disorders or process addiction (like gambling). [Advisory Panel on Post-Secondary Mental Health Final Recommendations Report; Report; 2017, p. 5-6]</p>	<p>Logic: C-E (mental health is associated academic performance); P-S (need effective post-secondary approaches to establish resiliency and coping skills) Formulation: Label (mental health encompasses addiction)</p>
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TABLE 13: GENERAL TRANSLATION TRENDS ACROSS CASES

INITIAL RESEARCH (POINT A)	POLICY OUTCOMES (POINT B)	LAGS AND GAPS	GENERAL TRANSLATION TRENDS
<p>CASE 1: ACES</p> <p>1998 Adverse Childhood Experiences Study from Felitti demonstrates heightened exposure to stress during childhood increases likelihood of lifelong neurobiological, mental and physical health issues</p>	<p>Beginning in 2008, we see the emergence of several policy documents, and more recently the topic is seen in school board publications, resources as well as regular publications for public, caregiver and educator audiences</p>	<p>Lag: 10 years (1998-2008) ABH; 12 years (1998-2010) ABE</p> <p>Gaps: ABE - four-year gap from 2010 to 2014</p>	<p>Causal links between early experiences and later mental health and substance use problems are clearly demonstrated, as are problems and solutions to mitigate the effects of stress on the developing brain. Metaphors are increasingly and consistently used in order to convey the brain story of development for audiences. Policy documents integrate labels and terminology directly imported from research early on and throughout time.</p>
<p>CASE 2: ORIGINS OF ADDICTION</p> <p>A 1997 publication by Leshner highlights brain science advancements and promotes the idea that addiction originates in the brain and is the result of complex interactions between neurobiology and social contexts</p>	<p>From 2007, the understanding of addiction as a brain disease emerges in policy publications and is now seen recommendations and plans, and routine publications for the general public</p>	<p>Lag: 10 years (1997-2007) ABH; 11 years (1997-2008) ABE</p> <p>Gaps: ABH – three-year gap between 2008-2011</p> <p>ABE – four year gap between 2008-2012</p>	<p>While the prominent idea throughout policy documents is that the origins of addiction lie within the brain, there is some lack of consensus on causal explanations as well as discussions of multiple appropriate courses of action for intervention, prevention (which are often linked to ACEs research) and especially treatment. Metaphors used typically engage those of AFWI and ACEs.</p>
<p>CASE 3: CONCURRENT DISORDERS</p> <p>Following a study from Kessler et al in 1996 that discusses the prevalence of and common epidemiology of addictions and mental illnesses, a 1998 study from Markou, Kosten and Koob demonstrated the neurobiological similarities of depression and drug depression, and the following year, 1999, Volpicelli et al similarly found common neural circuitry of PTSD and drinking</p>	<p>This concept is found in ministry documents beginning in 2004, but recent ministry recommendations and reports that mention the topic tend to neglect the neuroscience behind concurrent mental health and addiction problems and eventually the terminology and research disappear completely from policy documents</p>	<p>Lag: 6 years (1998-2004) ABH; 11 years (1998-2009) ABE</p> <p>Gaps: ABH - three-year gap between 2004-2007, two year gaps between 2007-2009 and 2011-2013, three-year gap between 2015-2018</p> <p>ABE – three-year gap between 2009-2012, four-year gap between 2012-2016, gap between 2016 to present</p>	<p>Particularly early on, terminology and definitions are variable, and scientific explanations are minimal. In later policy documents, the topic is absent and disappears in government conversations of how to integrate neuro and brain sciences into policy.</p>

TABLE 15: GENERAL SPEAKING ELEMENTS ACROSS ERAS AND CASES

ERA	CASE	Setting	Audience	Ends	Editing Rules	Genre
Until 2011	ACEs Lag from 1997 to 2007	-2007 AFWI formed to align Albertan perceptions of early development and mental health with brain science	-policy/ decision- makers -[gen public] -researchers	-improve services, funding -provide information -make recommendations	-cause/effect -prob/sol -local sol -labels	-reports, plan, fact sheet
	Origins Lag from 1998 to 2008	-AFWI promotes addiction as a brain disease for resource allocation	-policymakers	-provide information -make recommendation	-cause/ effect -prob/ sol -labels, definition	-information guide -report
	Concurrent Lag from 1998 to 2004	-2008 Alberta Health restructures, combines mental health and addiction services	-practitioners -policy/ decision- makers	-improve services -provide information -provide recommendation	-cause/ effect -prob/ sol -label, definition	-plan -information supplement -recommendation -literature review -learning module -strategy
2011-2014	ACEs		- policy/decision -makers -general public	-improved services -provide information -promote dialogue	-cause/ effect -prob/ sol -local sol -label, metaphor, narrative	-plan, report, routine publications
	Origins		-practitioners -policymakers -general public	-provide information -guide research and practice	-cause/ effect -prob/ sol -local sol	-report, policy, routine publications
	Concurrent		-policymakers -general public -practitioners	-guide action -provide information -make recommendation	--cause/ effect -problem -label, definition	-strategy, report, guidelines
2015 to present	ACEs		-general public -policymakers -practitioners	-make recommendation -action plans -provide information	-cause/ effect -prob/ sol -local sol -label, metaphor, narrative	-routine publication, reports, resource guide
	Origins		-general public -policymakers -OCYA	-make recommendation -provide information -action plans	-cause/ effect -prob/ sol -local sol	-report, recommendations, plans
	Concurrent		-practitioners -policymakers	-improve services -provide information -make recommendation	-cause/ effect -prob/ sol -label	-report, recommendation

TABLE 14: COMPARISON OF CASES AND TRANSLATION OUTCOMES

CASE	OVER TIME	COMMUNICATION	ACTORS AND POSITIONS	POLICY OUTCOMES	SIDEGROUP INVOLVEMENT
ACES	<p>The ACEs literature quickly becomes fully integrated, using consistent labels, definitions, metaphors and labels, into the publications of both ministries. Over time, there is a clear progression from information guides for policymakers, to reports and strategies, and toward the development of practitioner guidelines aiming to mitigate the effects of toxic stress on developing brain architecture.</p> <p>After 10-year lag, ABH first begins producing policy documents, and routinely communicates about ACEs research increasingly over time using AFWI metaphors in recent recommendations, reports and plans outline appropriate actions and routine publications for general audiences.</p> <p>ABE, after a 12-year lag, produced a policy maker fact sheet, and most recently publishes routine publications and conference summaries integrating ACEs research evidence and the metaphors of AFWI.</p>	<p>The Ministry of Education primarily communicates with educators, and sometimes provides recommendations or reports to policymakers. The aim of such documents is usually to provide information and resources for educators to improved educational environments. The documents from Alberta Health are often geared toward more general and decision maker audiences. The include reports, plans and routine publications that aim to reduce prevalence rates of ACEs and resultant addictions and mental health burdens. Both ministries employ AFWI narratives, especially after 2011 in their communications about ACEs research. In general, more local solutions are proposed by Alberta Health.</p>	<p>Both ministries consistently and coherently utilize labels imported from science and metaphors of AFWI in order to convey the science behind early childhood experiences and toxic stress. They heavily stress the importance of early experiences in lifelong health trajectories, and prioritize the prevention and intervention of addictions and mental health in early childhood in an effort to reduce the effect of toxic stress on the developing brain.</p>	<p>The ACEs research is found prevalently within policy documents, particularly after 2010, when AFWI developed and propagated several metaphors intended for local Albertan audiences.</p> <p>ABH most recently published a resource guide for practitioners that integrates ACEs literature, metaphors and narratives.</p> <p>ABE most recently published a budget summary and conference summary that aligns with the brain science of early experiences</p>	<p>AFWI (founded in 2007) becomes an extremely influential group, particularly from 2011 onward.</p> <p>The EMap Initiative from Alberta Government and Alberta Education published in 2009, and the Early Years Study 2 in 2007 highlighted the importance of neuroscience and early experiences for researchers and policymakers.</p>
ORIGINS	<p>Addiction increasingly becomes accepted as a chronic brain disease, but explanations of this</p>	<p>Addiction is not as consistently contextualized as in the ACEs case, and the problem of how to</p>	<p>There is some disagreement within and between ministries in their</p>	<p>The most recent policy documents from ABH are recommendations for policymakers in regards to cannabis legislation, and</p>	<p>AFWI becomes influential in its development of a Brain Story of addiction, and these metaphors and</p>

	<p>are not uniform in documents, particularly from Alberta Health.</p> <p>After a 10-year lag, ABH produced an information guide for policymakers explicating the neurobiological origins of addiction. There is a gap between 2008 and 2011 and increasingly, we see more reports and routine publications for policymakers and the general public. However, the explanations of causality are not as unified as they are in the ACEs case, and are more variable even as time goes on, although the definition of addiction seems to stabilize over time.</p>	<p>respond to neuroscience on the origins of the brain is heavily tied to solutions involving treatment more frequently during initial stages, and to prevention and intervention in later documents. Over time, especially in Alberta Health documents, the metaphors of AFWI are increasingly integrated. Alberta Education tends to avoid labels like ‘addiction’ in favour of other terms like ‘well-being’.</p>	<p>explanations of how addiction originates. Within Alberta Education documents, there is very little reference to addiction itself, but promoting school environments that foster wellbeing are seen as ways of preventing later substance abuse.</p>	<p>highlight the role of drug use on the developing brain.</p> <p>The most recent document from ABE is a teacher toolkit that provides basic information on the early brain origins of addiction to improve educational interventions for students.</p>	<p>narratives are routinely employed from 2011 onward, but multiple rationales are used to support this research and to make varying arguments about appropriate solutions.</p>
CONCURRENT	<p>Despite being the earliest case to demonstrate scientific explanations after a six-year lag, there are several gaps in publications that include conversations about the neuroscience of concurrent addiction and mental health issues. Recently, the ministry inclusion of such research nearly disappears, and only occurs in reference to other topics of conversation. There are nearly no Alberta Education documents that delve into the brain science behind concurrent disorders, and when they do, science references are more implicit, and are usually entirely absent.</p>	<p>Almost all documents rely upon labels and varying definitions to portray the underlying neurology of concurrent addiction and mental health issues. Most documents from both ministries are informational in nature, and are used to converse about other issues like gambling, child development, alcohol use and cannabis regulations. Research from neuroscience is rarely contextualized in a manner that aligns with research. Further, most documents rely on a cause and effect rationalization, and problematize concurrent disorders without offering clear solutions.</p>	<p>Both Alberta Health and Alberta Education vary in their use of terminology and definitions of concurrent disorders, and often neglect scientific explanations of it all. Instead, the issue of how to provide appropriate service care is problematized, but no clear solution is provided.</p>	<p>Only very vague and indirect references to concurrent disorders occur in a AHS recommendation for policymakers for legalization and regulation of cannabis.</p> <p>For ABE, the most recent policy document is a school district report that minimally and remotely addresses the prevalence of concurrent disorders.</p>	<p>There is little NGO activity that seems to influence this case. Federal interest in the burdens and prevalence rates of concurrent disorders are found early on, but provincial policy, especially as time go on, does not seem to mirror these concerns, and do not integrate the brain science of concurrent addiction and mental illness into publications. Eventually the topic, terminology and research become lost and disappear from policy documents.</p>

FIGURE 1: OVERVIEW OF METHODS PROCESS

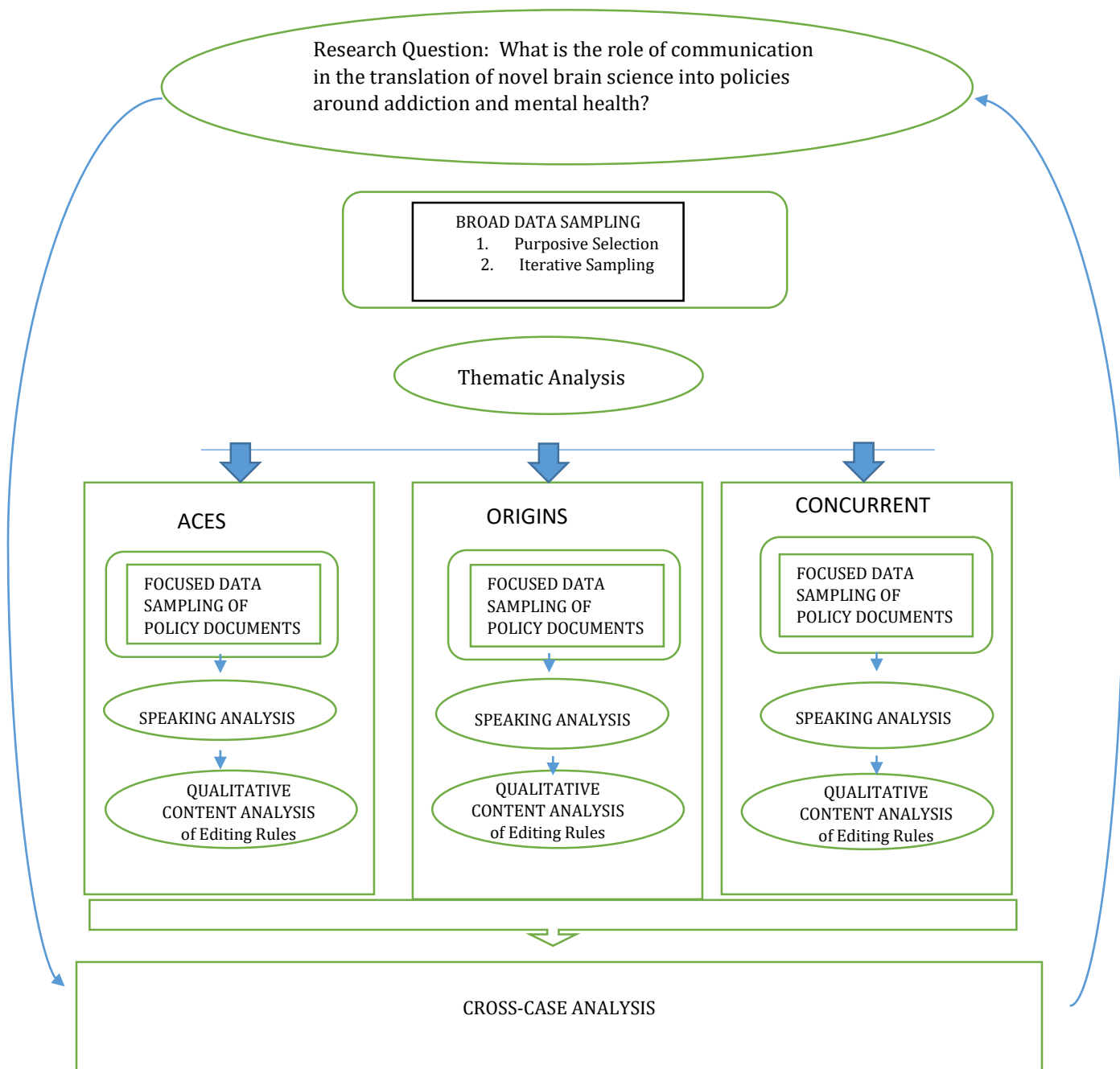


FIGURE 2: DIAGRAMS FOR EACH CASE PATTERNS OF COMMUNICATION INVOLVED IN THE TRANSLATION OF RESEARCH INTO POLICY

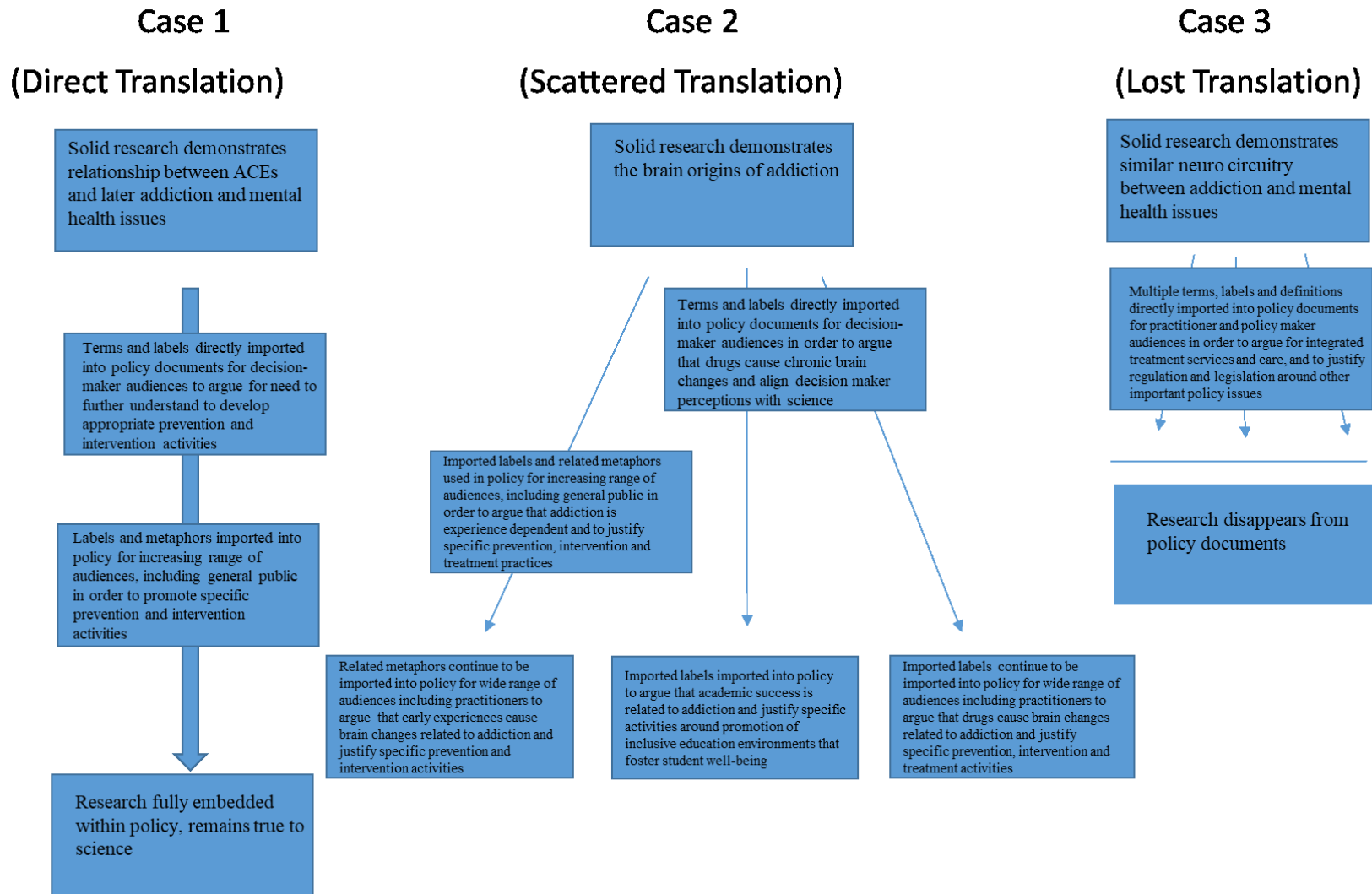


FIGURE 3: SIMPLIFIED FIGURE OF PATTERNS OF TRANSLATION PROCESS FOR EACH CASE

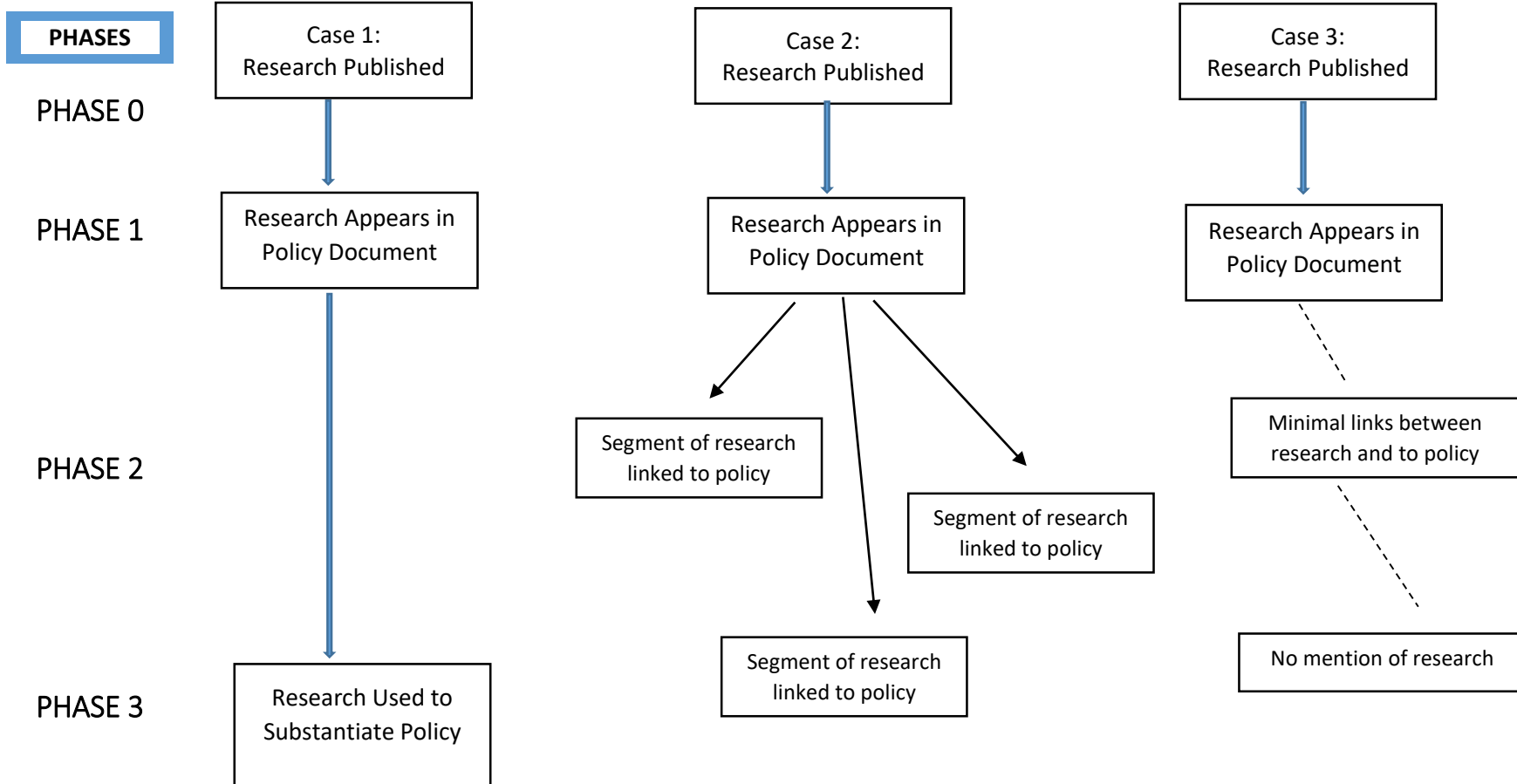


FIGURE 4: PROCESS MODEL FOR EFFECTIVE TRANSLATION

