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A neurodevelopmental lens in child protection social work: Understanding and addressing the impacts of adversity

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Abstract

This research explores how child protection social workers understand and address the impacts of childhood adversity through the application of a neurodevelopmental lens. To achieve this, a practice research methodology was utilised. Qualitative, semi-structured interviews were completed with three key informants (with expertise in the neurodevelopmental lens and/or te ao Māori) and 11 child protection social workers. The research drew on an ecological-transactional perspective. Thematic analysis was used to analyse the data. The findings from the study extend the existing principles of the neurodevelopmental lens and suggest some new principles as being important to child protection social workers. The research findings provide a framework for child protection social workers to understand and address the impacts of childhood adversity. The principles informed the selection of interventions to address the impacts of adversity. This study highlighted the importance of social workers working across ecological systems to address the impacts of structural forms of adversity on children and families. The research proposes a model for child protection social work and recommends further research into the neurodevelopmental lens.

Acknowledgements and dedication

Mō tātou, ā, mō kā uri ā muri ake nei

For us and our children after us[1]

This thesis is dedicated in loving memory to my brother Damon and Grandad Don, who both passed away in the final 18 months of writing this thesis.

Firstly, I want to acknowledge every child, young person, and their families I have worked with throughout my career. You have taught me so much, and I am grateful for the opportunity to have been your social worker. I am hopeful this thesis will make a meaningful difference for other children, young people, and their families who have experienced adversity.

To my beloved friends and whānau (biological and chosen), thank you for your unconditional support and encouragement to me throughout this (long) journey. Thank you, thank you, thank you! You have dealt with my absence over the past few years and listened to my ideas, progress, and frustrations, but most importantly, you have loved me for who I am. I love you all so much, and I could not have done it without your support, encouragement, dinners (and gins), and friendship.

To my doctoral supervisors, Dr Nicky Stanley-Clarke and Professor Robyn Munford, I could not have done this without you. You have been an incredible supervisory team, guiding, supporting, encouraging, and believing in me (at times when I did not believe in myself). You pushed (and at times with the perfect amount of robustness when I needed it), challenged, and

[1] Key informant, Mere, provided permission to use this whakataukī which originates from Ngāi Tahu.

inspired me throughout this journey. Thank you from the bottom of my heart for all your support – words cannot express how deeply grateful I am to have had you as my supervisors.

I have had the privilege of meeting many social workers throughout Aotearoa New Zealand. Despite the challenging situations in which you sometimes practice, I am so impressed by the incredible mahi (work) you do. I hope this thesis will be a taonga (gift/treasure) to support and inform your practice.

Finally (but certainly not least), to the key informants and participants who shaped this research, I am truly indebted to you for your generosity and time.

Ngā mihi nui ki a koutou,

Braden

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Glossary of acronyms

Acronym	Definition
ACEs	Adverse childhood experiences
ADHD	Attention deficit hyperactivity disorder
ANZASW	Aotearoa New Zealand Association of Social Workers
FGC	Family Group Conference
IASSW	International Association of Schools of Social Work
IFSW	International Federation of Social Workers
KPIs	Key Performance Indicators
NGOs	Non-government organisations
NMT	Neurosequential Model of Therapeutics
SAMHSA	Substance Abuse and Mental Health Services Administration
SDQ	Strengths and Difficulties Questionnaire
TF-CBT	Trauma-focused cognitive behaviour therapy
TIC	Trauma-informed care
TIP	Trauma-informed practice
TISS	Trauma-Informed Supervision and Support
UNCROC	United Nations Convention on the Rights of the Child
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

Glossary of te reo Māori terms[2]

Term	Definition
Aotearoa	Māori name for New Zealand.
Atua	Ancestor with continuing influence, god.
Awhi	To embrace, to surround.
Hapū	Kinship group, clan, tribe, subtribe. Consists of several whānau sharing descent from a common ancestor.
Hara	To be in violation of a tapu, transgress, commit a sin, violate the law, offend.
Hinengaro	Mind, thought, intellect, consciousness, awareness.
Hui	To gather, assemble, meet.
Iwi	Extended kinship group, tribe. Often refers to a large group of people descended from a common ancestor and associated with a distinct territory. A number of related hapū, usually sharing adjacent territories, form an iwi.
Kapa haka	A rhythmic chant and dance by a Māori cultural group.
Karakia	To recite ritual chants or recite a prayer.
Kaumātua	Elder, elderly man, elderly woman, old man - a person of status within the whānau.
Kaupapa	Topic, policy, matter for discussion, plan, purpose, scheme, proposal, agenda, subject, programme, theme, issue, initiative.
Kōrero	Speech, narrative, discussion, conversation, statement, information, discourse.
Manaaki	Support, hospitality of, caring.
Māori	Indigenous New Zealander.

[2] All definitions adapted/taken from Te Aka Māori Dictionary: https://maoridictionary.co.nz

Marae	The open area in front of the wharenui (meeting house), where formal greetings and discussions take place. Often also used to include the complex of buildings around the marae.
Māramatanga	Enlightenment, insight, understanding, light, meaning, significance, brainwave.
Mātauranga	Knowledge, wisdom, understanding, skill, education.
Mau rākau	Māori weaponry.
Mirimiri	Massage, to rub.
Oriori	To chant, a lullaby.
Papatūānuku	Earth mother.
Poi	A light ball on a string of varying length which is swung or twirled rhythmically to sung accompaniment.
Romiromi	To press firmly with the hands, squeeze, rub gently, massage.
Rongoā	Remedy, medicine, drug, cure, medication, treatment, solution (to a problem), tonic.
Taha hinengaro	Mental/emotional well-being domain of Te Whare Tapa Whā.
Taha tinana	Physical well-being domain of Te Whare Tapa Whā.
Taha wairua	Spiritual well-being domain of Te Whare Tapa Whā.
Taha whānau	Family well-being domain of Te Whare Tapa Wha.
Tamariki	Children.
Tamariki Māori	Māori children.
Tangata whenua	Local/indigenous people – typically referring to Māori.
Taniwha	Water spirit, monster, dangerous water creature, powerful creature.
Tapu	Sacred, prohibited, restricted, set apart, forbidden.
Tauiwi	Non-Māori.
Tautoko	To support, advocate.
Te ao Māori	Māori worldview.

Te reo Māori	Māori language.
Te Tiriti o Waitangi	The Treaty of Waitangi. The agreement between the British Crown and Māori.
Tikanga	Correct procedure, custom, habit, lore, method, manner, rule, way, code, meaning, plan, practice, convention, protocol - the customary system of values and practices that have developed over time and are deeply embedded in the social context.
Tinana	Physical.
Tūhonohono	To join.
Waiata	Song, chant.
Wairua	Spirit, soul of a person.
Waka ama	Outrigger canoe.
Whakapapa	Genealogy, lineage, descent. Usually includes connections between people, land (whenua), and water.
Whakarongo	To listen.
Whanaunga	Relative, relation, kin, blood relative.
Whānau	Family.
Whānau Ora	Family well-being.
Wharenui	Meeting house.
Whenua	Land.

Chapter One: Introduction

This thesis begins with Sean's story.[3] Sean's story highlights the lived experiences of children who have contact with the child protection system. It provides insight into the motivation and reasons for undertaking research on the neurodevelopmental lens as a framework for social workers to understand and address adversity. This research explores how child protection social workers understand and address the impacts of childhood adversity through a neurodevelopmental lens. The study draws on a practice research methodology, allowing for a pragmatic research design. This was a qualitative study utilising semi-structured interviews. This research was informed by the ecological-transactional perspective as a theoretical framework that enables the consideration of structural factors alongside individual factors in alignment with the principles of the social work profession (International Federation of Social Workers [IFSW] & International Association of Schools of Social Work [IASSW], 2014).

The chapter introduces the study, beginning with Sean's story followed by positioning the researcher. The research aim and questions are presented, followed by the rationale for the study and the background to the research, which includes definitions of key terms. The final section outlines the thesis structure.

Sean's story

I will never forget the first young person I was allocated as a new social worker. Sean was 12 years old and had been involved with the child protection system since birth. Sean's older brother was already with long-term caregivers (whom he ended up living with permanently). Sean's story was vastly different; having entered statutory care in his first few weeks of life, Sean's life was filled with abuse, trauma, neglect, and constant instability. For his first year of

[3] Name and identifying details have been changed for privacy reasons. Sean's story has been used with his permission.

life, he moved between his mum and foster caregivers, often for several days at a time, to try and keep Sean in his mother's care. This ultimately did not work, and Sean was placed with long-term foster caregivers, who were granted parenting orders for Sean, ending the state's involvement.[4] Sadly, they were not provided effective support after the state discharged their custody of Sean and they struggled to manage his behaviour (likely due to his experiences of adversity and, at the time, undiagnosed reactive attachment disorder). After a couple of years, this placement broke down and Sean was returned to foster care.

By the time I met Sean, at 12 years of age, he had experienced care from at least 45 different caregivers, numerous changes in schools (including several suspensions), and had been relocated to an entirely different region. The only person from his biological family he had contact with was his brother (and it was highly sporadic and limited). Understandably, Sean had numerous challenges with relationships, education, and managing his behaviour and emotions. He was desperate to feel loved and have a place of belonging. Sean was involved with numerous services (including child and adolescent mental health services), leading to various diagnoses (such as attention deficit hyperactivity disorder [ADHD] and reactive attachment disorder) and medication. Sean engaged in weekly talking therapy, but talking about emotions and engaging in a therapeutic relationship was challenging for him, and resulted in limited progress.

When I was assigned as Sean's social worker, he was placed with an elderly couple (whom he called Nan and Pop), with whom there was a loving relationship. Sadly, they were not able to provide long-term care for him. As a social work team, we needed to find a suitable, permanent home for Sean – we were clear that this upcoming move needed to be the last for Sean. We could not find an appropriate placement after exploring our pool of foster caregivers. With Sean's placement verging on breaking down, I compiled a list of everyone Sean had ever had

[4] Parenting orders can be granted by the Family Court for foster carers who would like to care for the child permanently, in place of care and protection custody orders in favour of the state.

contact with, and thankfully, my search was successful. Sean's previous teacher (whom he had a positive relationship with) and their family agreed to care for him. This placement would be a significant turning point for Sean, although it was difficult.

As Sean's assigned social worker, I worked hard to build a strong and supportive relationship with him. Drawing on ecological systems theory, I focused on strengthening the relationships around him and building on his strengths (he was a lovely, intelligent, charming, funny, and endearing young person). As a social work team, we committed to doing whatever was necessary to support this placement and strengthen Sean's relationships. Sean had regular time with Nan and Pop and another family he had lived with previously. During school holidays, Sean and his brother would spend time together. I focused on supporting healthy, positive relationships to support Sean's long-term healing journey.

While strengthening Sean's relationships and supporting relational permanence were good starting points, I was left wondering how to meaningfully support Sean in addressing his past experiences of significant adversity. Sean's story illustrates the challenges of understanding and addressing the complex impacts of adversity within child protection social work. The next section builds on this motivation by outlining my social positioning as a researcher.

Positioning the researcher

Research is influenced by the social positioning of the researcher as the researcher's own worldview affects the research process (Braun & Clarke, 2022). My social work practice background has predominantly been in working with children and families in non-government organisations (NGOs) and statutory child protection (both in Aotearoa New Zealand and the United Kingdom). Through my practice experiences, I was introduced to and trained in Dr Bruce Perry's work on the Neurosequential Model of Therapeutics (NMT; Perry, 2001, 2002, 2006, 2008, 2009, 2020; Perry & Dobson, 2013; Perry & Szalavitz, 2011, 2017).

This model became a useful organising framework for my social work practice and provided a framework through which I could understand the impacts of adversity and identify developmentally appropriate interventions. My own experiences of the approach became my motivation for this Doctor of Social Work research. I chose the Doctor of Social Work as I wanted to make a contribution to knowledge and understanding of the neurodevelopmental lens in professional child protection social work. In the next section, the research aim and questions are outlined.

Research aim and questions

This research explores how child protection social workers understand and address the impacts of childhood adversity through a neurodevelopmental lens. The study answers the following questions:

1. What principles do child protection social workers view as being important to the neurodevelopmental perspective?
2. How do child protection social workers use the principles of neurodevelopment to understand the impact of childhood adversity on their clients?
3. How do child protection social workers use the principles of neurodevelopment to inform intervention planning?
4. How could a model based on a neurodevelopmental lens be utilised in the Aotearoa New Zealand context?

To address the aim and answer these questions, this research draws on a practice research methodology, qualitative methods, and the ecological-transactional perspective as the theoretical framework (see Chapter Two). The study utilised a practice research methodology informed by the phronetic social sciences (Miller, 2019; Pain, 2011; Uggerhøj, 2011). Practice research is concerned with understanding and improving practice and adopts pragmatic methods to achieve the research aims (Andersen et al., 2020; Stephney & Thompson, 2021).

The study involved semi-structured qualitative interviews with three key informants (experts in the neurodevelopmental lens, the Aotearoa New Zealand context, and te ao Māori [Māori worldview]) and 11 child protection social worker participants to gain rich descriptions of how social workers utilise the neurodevelopmental lens in their practice. The ecological-transactional perspective (Cicchetti & Lynch, 1993; MacKenzie et al., 2011; Polak & Saini, 2019) was the theoretical framework used in this study as it allowed for the consideration of the interactions between the individual, microsystems, and macrosystem.

Rationale for this study

The neurodevelopmental lens can be a useful framework for child protection social workers to understand and address the impacts of adversity (Caplis, 2014; Mason et al., 2020). Both Caplis (2014) and Mason et al. (2020) found that practitioners viewed the neurodevelopmental lens as applicable in their practice with children who had experienced adversity. This study investigates the use of the neurodevelopmental lens in the context of Aotearoa New Zealand child protection social work.

This study contributes to the body of knowledge of the neurodevelopmental lens by exploring how child protection social workers within Aotearoa New Zealand can understand and address the impacts of adversity. Furthermore, the ecological-transactional perspective as the theoretical framework (Chapter Two) positions the neurodevelopmental lens within social work practice by considering individual and structural forms of adversity. The research is valuable for practitioners and child protection organisations by developing a model that enables the implementation of the neurodevelopmental lens into social work practice.

Background to the research

This section establishes a background for the research by defining childhood adversity and children (two key terms used throughout this thesis). The neurodevelopmental lens and the

use of neuroscience in social work are then briefly discussed. Background information on the child protection system in Aotearoa New Zealand is introduced, followed by a brief exploration of the impacts of adversity. The section concludes with an overview of recent reviews and reforms of the Aotearoa New Zealand child protection system, which has led to a shift towards trauma-informed practice (TIP).

Key definitions

The thesis utilises two key terms, which will be briefly defined here. Firstly, McLaughlin's (2016) definition of childhood adversity is adopted within this research: "Exposure during childhood or adolescence to environmental circumstances that are likely to require significant psychological, social, or neurobiological adaptation by an average child and that represent a deviation from the expectable environment" (McLaughlin, 2016, p. 363). Chapter Three discusses this definition further and includes a justification for the research's focus on adversity rather than trauma. Secondly, the term child(ren) is used to refer to any child or young person under the age of 18 years (unless specified).

The neurodevelopmental lens

The neurodevelopmental lens is an approach that supports the understanding of adversity and provides a framework through which the impacts of adversity can be addressed. The neurodevelopmental lens is the theoretical basis for the NMT developed by Dr Bruce Perry (a child psychiatrist; Perry, 2001, 2006, 2008, 2009; Perry & Dobson, 2013). Perry developed the lens out of frustration with traditional medicalised therapeutic approaches in addressing the developmental challenges resulting from trauma and neglect (Perry, 2020). Perry sought to create an alternative framework to the assessment and intervention of adversity that complements (rather than replaces) other theoretical perspectives by integrating knowledge from various disciplines, for example, neuroscience, psychology, social science, and sociology (Perry, 2020; Perry & Dobson, 2013). The lens comprises several principles (discussed in

Chapter Four) that explain how adversity affects an individual's development. The principles also inform how the impacts of adversity can be addressed.

The theoretical basis of the neurodevelopmental lens underpins the NMT.[5] The NMT is a structured assessment approach to considering a client's developmental history and current functioning (Perry, 2020; Perry & Dobson, 2013). The NMT utilises a range of clinical practice tools supporting practitioners to explore a child's history of adversity, protective relationships, and current brain-mediated functioning and connectedness. The assessment then supports the selection of developmentally informed interventions. The intervention philosophy begins with the therapeutic web (a network of invested adults and peers) and the family, focusing on the quality and permanence of relationships. Finally, recommendations are made for interventions for the child that seek to reflect the sequential nature of development in a bottom-up approach (i.e., lower regions of the brain are targeted before higher regions). The NMT has been used in a variety of settings to improve the outcomes of children and young people, such as inpatient psychiatric settings (de Nooyer & Lingard, 2016), early childhood services (Barfield et al., 2012), outpatient mental health services (Zarnegar et al., 2016), adoption services (White et al., 2023), therapeutic services (Frederico et al., 2019; Jackson et al., 2009), and residential foster care (Hambrick, Brawner, Perry, et al., 2018b).

Social work and neuroscience

This research contextualises the neurodevelopmental lens within the profession of social work. The agreed IFSW and IASSW (2014) global definition of social work states:

> Social work is a practice-based profession and an academic discipline that promotes social change and development, social cohesion, and the empowerment and liberation of people. Principles of social justice, human rights, collective responsibility and respect for diversities are central to social work. Underpinned by theories of social

[5] The NMT is described in greater detail in Chapter Four.

> work, social sciences, humanities and indigenous knowledges, social work engages people and structures to address life challenges and enhance wellbeing.

Social work is concerned with the intersection between structural factors and individual well-being. This is a tension for social workers drawing on neuroscience (such as the neurodevelopmental lens) within their practice. Critics of the use of neuroscience within social work practice have argued that neuroscience focuses on the individual without due consideration of the impact of structural factors on experience and outcomes (discussed further in Chapter Three; Beddoe & Joy, 2017; Joy, 2022; Wastell & White, 2012). As such, the social work orientation of this research has led to the adoption of an ecological-transactional perspective as a theoretical framework to allow for the consideration of the structural influences on adversity. This is discussed in greater detail in Chapter Two and Three.

Child protection in Aotearoa New Zealand

This research is located within the context of Aotearoa New Zealand. Aotearoa New Zealand is home to the indigenous Māori people and was colonised by the British and other settlers from Europe. Te Tiriti o Waitangi (signed in 1840) is the founding agreement between the Māori and the British Crown, setting out the terms and conditions of settlement and governance of non-Māori in Aotearoa New Zealand. Māori never ceded sovereignty under Te Tiriti o Waitangi. The forced colonisation and oppression of Māori has included the dispossession of land, the intentional destruction of whānau (family) structures and culture, and the introduction of capitalist economic systems (Hyslop, 2022; Keddell et al., 2022). This has resulted in significant, long-lasting, and intergenerational social and economic impacts, creating an overrepresentation of Māori in various systems, such as child protection, the criminal justice system, and mental health (Hyslop, 2021, 2022; Keddell et al., 2022). The

child protection system has its roots in colonial Britain.[6] The impacts of colonisation and a colonial child protection system have disproportionately impacted Māori and those living in poverty (Fitzmaurice-Brown, 2023; Hyslop, 2022; Keddell et al., 2019; Keddell et al., 2022). Given that this study is within the Aotearoa New Zealand context and explores social workers' use of a neurodevelopmental lens, the consideration of structural adversity, such as colonisation and economic inequality, is important to understanding child protection practice (Joy, 2022) and, therefore, this research.

Oranga Tamariki – Ministry for Children is the statutory child protection agency in Aotearoa New Zealand. Social workers are the predominant workforce employed by Oranga Tamariki[7] to fulfil its statutory care and protection obligations set out in the Oranga Tamariki Act (1989). Whilst Oranga Tamariki holds the statutory responsibility for implementing the Oranga Tamariki Act (1989), other NGOs and iwi (Māori tribe) organisations also play an essential role within the wider child protection system. NGOs and iwi organisations provide important support and interventions for children and their families involved with Oranga Tamariki. They offer services such as family support, Family Group Conference (FGC) planning and monitoring, Social Workers in Schools, parenting education and support, therapeutic interventions, and foster care services.[8] This broader conceptualisation of the child protection system aligns with the Aotearoa New Zealand shift towards the devolution of statutory power and greater community involvement in the care and protection of children, which began in the 1980s under the umbrella of significant state reform (Hyslop, 2022). NGOs and iwi organisations employ a variety of professionals, including social workers.[9] For the purposes of this thesis, child protection social workers are social workers (whether employed by Oranga

[6] See Hyslop, 2022 for a comprehensive history of the child protection system in Aotearoa New Zealand.
[7] Approximately 2,200 social workers are employed by Oranga Tamariki (Social Workers Registration Board, 2022).
[8] Some non-government and iwi organisations can be granted care and protection orders (such as custody orders) under the Oranga Tamariki Act (1989).
[9] There are approximately 3,500 social workers employed by NGOs and iwi organisations (Social Workers Registration Board, 2022).

Tamariki, NGOs, or iwi organisations) who work with children and their families as part of the broader care and protection system.

The Oranga Tamariki Act (1989) sets out the legislative framework for child protection based on a notify-investigate-intervene model (Fitzmaurice-Brown, 2023). The Act (s. 4) aims to "promote the well-being of children, young person, and their families, whānau, hapū [kinship group], iwi and family groups" (translation added in square brackets). The Act applies to children and young people under 18 years of age.[10] The Act (s. 15) allows members of the public or professionals to notify Oranga Tamariki of concerns for the safety and well-being of children. Oranga Tamariki is then able to investigate these concerns (s. 17).[11] If a social worker assesses that a child is in need of care and protection due to suffering or is likely to suffer serious harm (defined in ss. 14 and 14AA), then the social worker must arrange for an FGC to be held (a family-led decision-making process; s. 19). The Act also sets out a range of care and protection orders (including custody orders) which Oranga Tamariki (or NGOs and iwi organisations) can apply for through the Family Court in situations where additional protective actions are required.

Demographics of the Aotearoa New Zealand child protection population

Oranga Tamariki received almost 75,000 reports of concern about 54,000 children and young people in the 12-month period ending 30 June 2024, amounting to approximately five percent of all children in Aotearoa New Zealand coming to the attention of Oranga Tamariki (Oranga Tamariki, 2024b). Children who identified as male were more likely to be involved in the care and protection system. During the year ending 30 June 2024, 54% (compared with 51% of the population) of the children worked with identified as male and 45% (compared with 48% of

[10] The Act allows for ongoing support of young people in some circumstances up to the age of 25 years.
[11] Oranga Tamariki are currently considering the devolution of powers to iwi organisations and NGOs. This devolution of power may include the ability of other organisations to investigate child protection concerns.

the population) identified as female (Oranga Tamariki, 2024b).[12] Of the children in care on 31 March 2023, 4% were aged 0-1 years, 17% were 2-5 years, 23% were 6-9 years, 28% were 10-13 years, and 29% were 14+ years (Oranga Tamariki, 2024a). Oranga Tamariki (2024b) reported 50% of children in care were living with their family or whānau.

The number of children in the care of Oranga Tamariki has decreased from 5,940 in 2020 to 4,095 as of 30 June 2024 (Oranga Tamariki, 2024b). This significant decrease in the number of children in care is likely due to practice changes made within Oranga Tamariki following public and political pressure in response to a high-profile media case of Oranga Tamariki removing a Māori newborn baby in 2019 (see Keddell et al., 2022 for further discussion). Despite a strong focus by Oranga Tamariki on working with Māori more effectively, Māori and Pacific children remain significantly overrepresented in the care and protection system in Aotearoa New Zealand. Oranga Tamariki (2024b) reported in the 12 months prior to 30 June 2024, the ethnicities of children in custody consisted of 68% identifying as Māori (compared with 17.8% of the total population) and 17% identifying as Pacific (compared with 8.9% of the total population).

The impacts of adversity

Sean's story identified some of the challenges for children in the care system. Child protection social workers encounter children and young people with similar stories to Sean every day. These children have experienced abuse, neglect, or maltreatment (Richardson et al., 2008; Rouland & Vaithianathan, 2018) and may also be impacted by structural factors, such as poverty, racism, marginalisation, and disadvantage (Keddell et al., 2019). These adverse experiences have been found to have a wide range of negative effects on a number of domains of functioning, including increased risk of psychiatric and health conditions and neurocognitive, social, and developmental delays (Cook et al., 2005; Kavanaugh et al., 2017;

[12] One percent was unknown or identified as another gender.

Richardson et al., 2008; van der Kolk, 2014). These experiences can impair long-term functioning and increase the risk for psychiatric and health conditions, and neurocognitive, social, and developmental delays (this is discussed further in Chapter Three; Anda et al., 2006; Cook et al., 2005; Felitti et al., 1998; Kavanaugh et al., 2017; Pugh et al., 2023; Richardson et al., 2008; van der Kolk, 2014). The Adverse Childhood Experiences (ACEs) study, undertaken by Felitti et al. (1998), is one of the largest epidemiological studies to explore the links between ACEs and later life outcomes, such as health, mental health, and behaviours (such as alcohol and drug abuse, risk of perpetration of intimate partner violence, and risky sexual behaviour). The study and others based on it have consistently found a strong correlation between higher numbers of ACEs and poorer outcomes across numerous measures later in life (Anda et al., 2006; Felitti et al., 1998; Petruccelli et al., 2019).

Whilst generally, ACEs can lead to negative impacts on a child's development, the impacts can vary, with some children experiencing high levels of adversity yet not having poor outcomes (Xu et al., 2023). The variation in the impacts on development can be explained through the complex nature of human development. Human development is influenced by a number of factors including genetics, experiences, and the interactions between these (this is discussed further in Chapter Four; Belsky & de Haan, 2011). It is important to note that every individual's experiences are unique and the culmination of experiences is what contributes to the unique developmental trajectory.

The ecological-transactional perspective (the theoretical framework used in this research and discussed further in Chapter Two) provides a possible explanation for the variances in outcomes (Cicchetti & Lynch, 1993; MacKenzie et al., 2011). The perspective proposes development is influenced by the interactions between the child and the various systems surrounding them. At each level of the system, adverse and protective factors interact with the individual influencing development.

Positive experiences can buffer and protect against the impacts of adversity (Han et al., 2023; Raghunathan et al., 2024). Positive experiences have been defined as "favourable experiences between birth to age 18 characterized by internal and external perceived safety, security, and support; and positive and predictable qualities of life" (Narayan et al., 2018, p. 20). These protective factors can support the development of resilience (the ability to return to adapt successfully following adversity; Ungar, 2021). A variety of factors have been found to promote resilience which include family, social, and community relationships, access to resources, cultural connections, and internal assets, such as positive core beliefs and self-esteem (Han et al., 2023; Ungar & Liebenberg, 2011). These positive experiences can be located at multiple levels of the ecology and cumulate to protect against the potential impacts of ACEs. Expectedly, a systematic review of positive childhood experiences research found higher number of positive childhood experiences were associated with better mental health and prosocial outcomes (Han et al., 2023).

The consideration of adversity and compensatory positive experiences is important for child protection social workers. As previously mentioned, the Oranga Tamariki Act 1989 allows for a number of interventions to ensure the safety and wellbeing of children. In situations where the child is at risk of significant harm, removal from the child's parents or caregivers is one such intervention option. It is, therefore, important to consider how out-of-home care may impact a child's wellbeing. As will be outlined in the next section and discussed further in Chapter Three, a Government-led review into the care and protection system in Aotearoa New Zealand found children involved in the care and protection system had poorer outcomes in a number of domains (Rebstock et al., 2015a, 2015b).

Research has found that children in kinship care can have better wellbeing, mental health, and behavioural outcomes, and greater placement stability than children placed outside of their family (Hu et al., 2024; Winokur et al., 2018). This is likely due to children in kinship care maintaining stronger connections with their family and culture, which can play an important

role in development (Connolly et al., 2017; Hu et al., 2024). In comparison, factors affecting poor outcomes have also been researched. Hu et al. (2024) found males, children with a higher number of substantiated maltreatments, and having more placements were correlated with higher levels of socio-emotional difficulties. Additionally, research has identified children who enter care when they are older often have a greater exposure to maltreatment and adversity and associated greater difficulties with socio-emotional difficulties (Hu et al., 2024; Pritchett et al., 2013). The next section discusses attempts to reform the child protection system in order to move towards a trauma-informed approach to improve outcomes for children in care.

Reviews, reforms, and becoming trauma-informed

Since the 1980s, the statutory child protection system has undergone numerous reviews and reforms in an attempt to improve outcomes for children and families, especially Māori and Pasifika who are disproportionately represented in child protection services (Fitzmaurice-Brown, 2023; Hyslop, 2022; Keddell et al., 2022). Most of the more recent reviews have focused on the role of the state in decision-making for children and their families, particularly in relation to the removal of children. However, the 2015 Aotearoa New Zealand Expert Advisory Panel review (Rebstock et al., 2015a, 2015b) focused on the poor outcomes for children involved with the care and protection system.[13] The review found poorer outcomes (compared with those who had no contact with the care and protection system) for children who encountered the child protection system (Rebstock et al., 2015b). By the time they were 21, they were more likely to have received a benefit, been involved with the criminal justice system, and left school with fewer qualifications than those with no contact (Rebstock et al., 2015b). This review recommended that the child protection system develop a TIP approach to improve the longitudinal outcomes for those involved with the care and protection system (Atwool, 2019; Rebstock et al., 2015a). Yet, some years after the 2015 Aotearoa New Zealand

[13] The review was commissioned by a neoliberal National-led government which adopted a social investment approach with a focus on reducing the burden on the state through a focus on early intervention, risk, and cost mitigation. This is discussed in detail in Chapter Three.

reforms,[14] TIP appears to have been implemented in a limited manner in Aotearoa New Zealand's child protection social work practice (Atwool, 2019; Boese, 2020; Dyer & Chisnell, 2023).[15] There remains a need for social workers to understand and address the impacts of trauma and adversity, particularly within child protection social work, as there can be long-term impacts on well-being. The neurodevelopmental lens provides one framework through which this can be achieved.

Thesis structure

In this chapter, **Chapter One**, Sean's story sets the scene for the research. The research aim and questions were identified, and the rationale and background to the study presented.

Chapter Two presents the practice research methodology and qualitative methods utilised in this research. The methodology and methods chapter is located before the literature review (Chapter Four) as Chapter Four integrates the findings from the key informant interviews. The research utilised semi-structured interviews with key informants with expertise in the neurodevelopmental lens and/or te ao Māori and with participants who were child protection social workers. An ecological-transactional perspective is presented as the theoretical framework utilised in this research to situate the neurodevelopmental lens within an ecological model, allowing for the consideration of macrosystem and structural factors.

Chapter Three discusses practice theory within child protection social work. This leads to an exploration of the use of trauma-informed approaches (both internationally and in Aotearoa New Zealand) within child protection social work. Finally, the challenges of integrating neuroscience into social work practice are discussed.

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[14] Oranga Tamariki was established as a stand-alone child protection agency in 2017 as a result of the 2015 Expert Advisory Panel review.
[15] Trauma-informed practice is discussed in more detail in Chapter Three.

Chapter Four interrogates the extant literature relating to the neurodevelopmental lens. The findings of the key informant interviews are also presented alongside the literature, as there was limited literature in Aotearoa New Zealand, which examined how the neurodevelopmental lens is used within child protection practice. The interviews with the key informants provided expertise in the use of the neurodevelopmental lens within the Aotearoa New Zealand context.

The findings from the participant interviews are presented in **Chapter Five**. The data analysis identified several themes relating to how child protection social workers utilised the neurodevelopmental lens to help them understand and address the impacts of adversity. These were brain development, the influence of experiences on development, responding to stress and regulation, and attachment relationships, connection and belonging. The study also found that social workers worked collaboratively across the various systems working with a child and considered the impacts of structural factors (such as poverty) as a form of adversity. The chapter also discusses how social workers learnt about the neurodevelopmental lens and social workers' perceptions of the challenges and strengths of the approach.

Chapter Six answers the first three research questions by discussing the findings from the key informant and participant interviews and the literature. Key principles of the neurodevelopmental lens are identified. The principles are then utilised to explain how child protection social workers understand the impacts of adversity, including structural forms of adversity. A model for use within child protection social work is introduced (Research Question Four). Finally, the principles are used to explain how child protection social workers select developmentally informed interventions to address the impacts of adversity.

The final chapter, **Chapter Seven**, concludes the thesis and summarises the key findings. It also outlines the model (introduced in Chapter Six) based on the neurodevelopmental lens for use in child protection social work practice and discusses the implications for social work

knowledge and practice. The limitations of this study and areas for future research are presented.

Chapter summary

This chapter introduced the motivation and rationale for this research through Sean's story. This research explores how child protection social workers understand and address adversity, utilising a neurodevelopmental lens within their practice, and seeks to make a contribution to professional social work knowledge and practice. The background and context of this research were presented. The next chapter discusses this study's research methodology, methods, and theoretical framework.

Chapter Two: Methodology, methods, and theoretical framework

This research focuses on exploring how a neurodevelopmental lens can be applied in child protection social work to understand and address the impacts of childhood adversity. The study answered four questions:

1. What principles do child protection social workers view as being important to the neurodevelopmental perspective?
2. How do child protection social workers use the principles of neurodevelopment to understand the impact of childhood adversity on their clients?
3. How do child protection social workers use the principles of neurodevelopment to inform intervention planning?
4. How could a model based on a neurodevelopmental lens be utilised in the Aotearoa New Zealand context?

This chapter describes the practice research methodology, the methods, and the theoretical framework used in this research to answer the research questions. The methodology and methods are introduced at this point in the thesis because interviews with the three key informants were completed before interviews with the 11 research participants. The key informant interviews supplemented the literature review, informed the questions in the interview schedule, and provided an Aotearoa New Zealand perspective on the topic. The findings from the key informant interviews are integrated into the literature chapter (Chapter Four). The results from the participant interviews are presented in Chapter Five.

This chapter begins with a discussion of the practice research methodology used in this research. This is followed by an overview of the research's theoretical framework of an ecological-transactional perspective that underpins the research methods and design. Next, the research design and methods are outlined, including recruitment and sampling, data

collection, and data analysis. Ethical considerations are then discussed. Finally, some of the methodological limitations are purveyed.[16]

Methodology

This research adopted a practice research methodology. Practice research seeks to explore social work practice and develop new theories and methods to improve the quality of practice (Miller, 2019; Pain, 2011; Uggerhøj, 2011). Practice research has several key characteristics: practice experience shapes research from a desire to know more or improve practice; the design is pragmatic; the research focuses on practice rather than the theoretical; and the practitioner-researcher is concerned more with communicating with other practitioners than publishing in scientific journals (Andersen et al., 2020; Stephney & Thompson, 2021). As such, within practice research, new theory emerges from practice, and there are high levels of collaboration between practitioners and researchers to answer questions that are relevant to practitioners and ultimately change practice (Andersen et al., 2020; Miller, 2019; Pain, 2011; Uggerhøj, 2011; Uggerhøj & Wisti, 2020). This study sought to explore child protection social workers' use of the neurodevelopmental lens and can, therefore, be considered practice research. As a Doctor of Social Work research project, this study sought to make a contribution to professional social work knowledge, understanding, and practice, meaning a practice research methodology is appropriate for this research. Furthermore, a key motivation for undertaking this research is to improve practice relating to childhood adversity (as outlined in Chapter One), another important aspect of practice research.

As a methodology, practice research has its own epistemological and ontological assumptions. Uggerhøj (2011) explained that practice research methodology draws on the work of the *phronetic* social sciences. Flyvbjerg (2001) questioned whether humanities-based research

[16] The methodological limitations are revisited in the final chapter of the thesis.

could and should utilise natural science techniques as social science research explores human phenomena, which is subject to "human consciousness, volition, power and reflexivity" (Flyvbjerg et al., 2012, p. 1). Instead, Flyvbjerg proposed the Aristotelian concept of *phronesis* as a better fit for social science research, defining phronesis as "knowledge that is sensitive to its application in specific settings and is, therefore, able to manage itself (and more), which is what gives it prominence in social thought and action" (Flyvbjerg et al., 2012, p. 1). As such, practice research, through the understanding of phronesis (the terms practice-research and phronesis are used interchangeably in this thesis), is the application of practice wisdom to build the contextual understanding of social issues and power dynamics and it includes the exploration of specific values and interests (Flyvbjerg, 2001; Flyvbjerg et al., 2012; Schram, 2012). It does not favour qualitative or quantitative research methodologies. Instead, it is a pragmatic approach concerned with context-specific research, develops out of practice, appreciates the presence of power, and ultimately, through praxis, results in change (Flyvbjerg et al., 2012). The use of a phronetic approach results in challenges to the objectivity of traditional research approaches: "It is thus impossible to understand practice knowledge from a neutral and distant position, such as might be undertaken by an external academic researcher with no practice context" (Miller, 2019, pp. 681-682). The practitioner-researcher actively participates in the research and contributes to knowledge production as they interpret the findings through their own lens and understanding of practice (Muurinen & Satka, 2020). Muurinen and Satka (2020) explained that practice research methodologies propose that "knowledge is seen to be built, shaped and clarified in action, the significance of experiential knowledge based on individual situations in social work practice is emphasised" (Murrinen & Satka, 2020, p.129). This approach aligns closely with practice theories or the concept of theorising practice.

The researcher has an insider status within practitioner research. Within Chapter One, the researcher's position as a child protection social worker with training and experience in the neurodevelopmental lens was discussed. As will be outlined below (in the Recruitment and

sampling section), the participants were also social workers working with children and families who had familiarity with the concepts of neurodevelopment and adversity. This commonality of sharing a common identity, language, and experiences with the research participants is what makes this insider research (Chammas, 2020; Dwyer & Buckle, 2009). The insider status supported rapport building and trust to be developed facilitating shared understanding and adding depth of data (Dwyer & Buckle, 2009).

Insider status can also create challenges for the research process by influencing the way in which the researcher asks questions or interprets data (Chammas, 2020; Dwyer & Buckle, 2009). Dwyer and Buckle (2009) suggest this challenge can be overcome by critical reflection by the researcher on the research process and awareness of their own biases and perspectives. Within this study, supervision with the doctoral supervisors was utilised to facilitate reflection on the research process and to explore the influence of the researcher's own biases and assumptions. For example, in the early stages of the doctoral candidacy, the researcher had an overly positive view of the neurodevelopmental lens. Through exploring this positive bias in supervision, the researcher was challenged to think more broadly about the lens and the potential challenges of the approach. This led to a deeper critical exploration of the literature and data. The following section introduces the theoretical framework utilised in this research. The theoretical framework informed the methods used, data collection (for example, the interview questions) and data analysis.

An ecological-transactional perspective: A theoretical framework

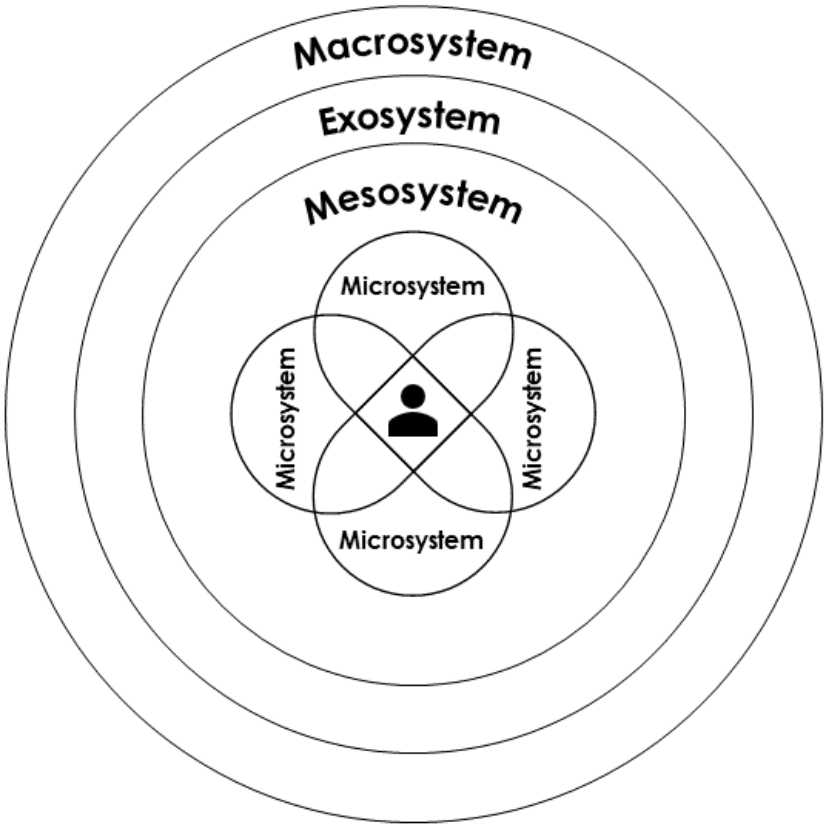
The ecological-transactional perspective draws on the work of two theoretical approaches (ecological systems and the transactional model) to understand child maltreatment (Cicchetti & Lynch, 1993; MacKenzie et al., 2011).

Firstly, the original work of Bronfenbrenner (1979)[17] and Belsky (1980) proposed an ecological systems approach to consider how multiple levels of the ecological system influenced human development and child maltreatment, respectively. The ecological systems approach suggests there are multiple levels of the ecology (Harms & Connolly, 2019; McNamara, 2011). Figure 1 visually shows the layers of the ecology, with the individual located at the centre. Microsystems are the immediate environments surrounding an individual (i.e., their family and their classroom). Within the context of understanding child abuse, considering the parents' ontogenic development, that is their developmental experiences and background that influence them, is seen as being important (Cicchetti & Lynch, 1993; Sidebotham, 2001). The mesosystem is the linkage between two or more microsystems (i.e., the interaction between the family and the school). The exosystem is the broader community within which the individual lives (but in which the individual is not involved) and comprises relationships between various systems (i.e., between home and a parent's workplace) and may have an indirect influence on the individual. Finally, the furthest system from the individual is the macrosystem, which is the culture of society and contains aspects such as values and beliefs. Bronfenbrenner (1979) also included a definition of what later became referred to as the chronosystem within his ecological systems model (the chronosystem has generally not been included within an ecological-transactional perspective and so is not discussed further). The chronosystem refers to the changes over time occurring with the ecological environment, for example, starting school. As the ecological levels become more proximate to the individual, they have a greater influence on the individual's development (i.e., parents have a greater impact than social structures), yet all the levels interact with each other (i.e., parents are influenced by the exosystem and macrosystem), influencing development (Belsky, 1980; Cicchetti & Valentino, 2006).

[17] Bronfenbrenner later extended his ecological systems theory to a bioecological model. The original ecological systems theory is utilised in the ecological-transactional perspective and so the bioecological model is not discussed here further. See Bronfenbrenner and Morris (2006) for an overview.

Figure 1

Ecological systems model



Note: Adapted from Harms and Connolly (2019).

The second theoretical foundation in ecological-transactional perspectives is the transactional model of child development, which emerged around the same time as Bronfenbrenner's ecological systems approach (MacKenzie et al., 2011; Sameroff & Mackenzie, 2003). The transactional model positions the development of the individual as a product of continuous bidirectional, interdependent, and dynamic transactions between the individual and the experience provided by their family and broader social context over time (Sameroff, 2009; Sameroff & Mackenzie, 2003). Sameroff (2009) explained that "developmental changes are defined by changes in the way the child interacts with experience" (Sameroff, 2009, p. 8). The transactional model provides greater depth of understanding than simply an interactional approach. An interactional approach considers how an individual interacts with their

environment. However, the transactional approach explores how an individual and their environment change because of interactions.

Cicchetti and Lynch (1993) first proposed the formal joining of the two approaches. The ecological-transactional perspective has been used to build an understanding of the interaction of factors influencing development, particularly child maltreatment (Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019). This approach allows for the exploration of how various protective and risk factors at each level of an individual's ecological system interact together to influence the individual's development. Each of these risk and protective factors can be either enduring or transient in nature and interact with the other systems. As such, an enduring risk factor in the macrosystem is likely to affect the microsystem and impede development, whilst a transient protective factor in the macrosystem is likely to offset some of the negative impacts, but only for as long as it is present. An ecological-transactional perspective, therefore, provides a framework through which various protective and risk factors can be considered at each level of the system and how they interact together, culminating in development. The consideration of the risk and protective factors at each level of the ecology, and whether they are temporary or enduring, is a strength of an ecological-transactional perspective. Considering the influence of both risk and protective factors is important as it draws on a strengths-based perspective, minimising the risk of solely focusing on risks within the child protection context. Similarly, considering various factors as possibly being enduring or transient allows for hope for change, particularly for transient factors. When a risk factor is transient, it is easier to address and reduce its impact due to its temporary nature. Building on temporary protective factors so they become enduring is another way to support well-being and change. Child development is a complex process, and this perspective allows for greater attention to be paid to the nature of risk and protective factors, recognising that each person's circumstances are different, and may result in different outcomes. Importantly, it also supports the exploration of the impact of structural factors on individuals.

This perspective, therefore, provides a suitable framework through which various theoretical viewpoints, including those of the social sciences and neuroscience, can be effectively integrated (challenges with the integration of neuroscience into social work practice are discussed further in Chapter Three; Munro & Musholt, 2014; Sidebotham, 2001). It addresses Cicchetti's (2013) call for a greater focus on understanding how psychosocial factors and biological factors interact in a dynamic manner in order to produce resilience in children who have experienced childhood adversity. An ecological-transactional perspective reduces the risk of focusing solely on the individual and their immediate surroundings when considering neuroscientific knowledge by considering how structural forces, such as poverty and colonisation, impact the individual, including their neurobiology (Bath, 2017; Beddoe & Joy, 2017; Munro & Musholt, 2014). The integration of neuroscientific knowledge within an ecological approach "explains how environment and person actually impact one another, and in so doing, corrects our long-held belief in the separateness of environment and person" (Green & McDermott, 2010, p. 2426). This research, therefore, drew on an ecological-transactional perspective as it ensured a focus remained on the person and their broader environment, which is a cornerstone of social work practice.

The theoretical framework underpinned the research and informed the literature review, data collection, and data analysis processes. This is returned to in subsequent sections and chapters. The next section discusses the research design.

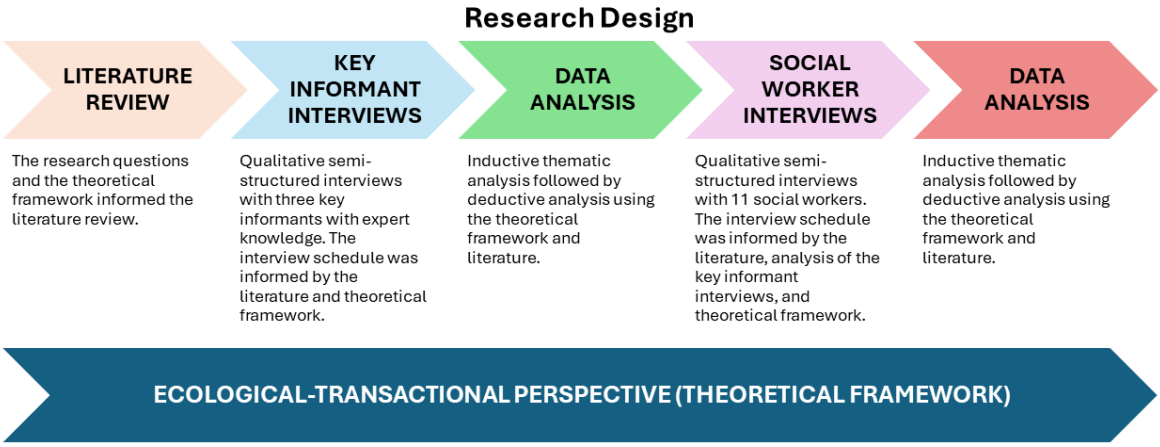
Research design

As will be established in Chapter Four, there is limited existing research on a neurodevelopmental lens within child protection social work practice. This research is, therefore, important as it contributes to providing a practical and theoretical understanding of how the neurodevelopmental lens is used within child protection social work practice and provides a model for use within the Aotearoa New Zealand context.

Figure 2 visually depicts the research design. The first stage of the research was to conduct a review of the literature. Secondly, following ethical approval, interviews with three key informants were conducted. The literature review informed the key informant interview schedule. Key informant interviews support a broad perspective on a research topic from individuals with special or expert knowledge (Taylor & Blake, 2015). The key informant interviews were utilised within this research to supplement the literature, inform the participant interview schedule, and provide greater knowledge and context of the neurodevelopmental lens within child protection social work and the Aotearoa New Zealand context. As such, the findings from the key informant interviews are integrated alongside the literature in Chapter Four. Next, the data gathered from the key informant interviews was analysed (inductively and then deductively with key concepts from the literature and the theoretical framework in mind). Following this, qualitative semi-structured interviews were conducted with experienced child protection social workers to explore how they understood and worked to address the impacts of childhood adversity using a neurodevelopmental lens in their practice. The interview schedule for the participant interviews was informed by the literature, theoretical framework, and data analysis from the key informant interviews. Finally, the participant interview data was analysed (again, both inductively and deductively).

Figure 2

Overview of research design



The next section explains the recruitment and sampling approach.

Recruitment and sampling

The research adopted a purposive sampling strategy for both key informants and participants. Purposive sampling is a technique whereby the researcher selects participants who may be able to provide the necessary data in order to adequately address the research questions (Daniel, 2012; Emmel, 2013). Pre-specified inclusion or exclusion criteria guide the researcher as to the appropriate participants (Daniel, 2012). The exploratory nature of the study meant that a purposive sampling strategy was the most appropriate strategy as this ensured that the participants had sufficient knowledge and experience to be able to meaningfully answer the research questions.

Key informant interviews

Recruitment method

Key informants were selected as they held specialist knowledge about a specific topic relevant to the research (Taylor & Blake, 2015). The use of key informants in the current study provided a depth of information necessary to contextualise the literature and to enable further understanding of the topic. Key informants were chosen because they held knowledge of the:

- Neurodevelopmental lens, and/or
- Māori cultural worldview (within the care and protection area).

The use of key informants with neurodevelopmental expertise was important as it provided greater depth of knowledge, understanding and application of the concepts. The use of a key informant with Māori cultural knowledge supported contextualisation and understanding of a te ao Māori (Māori worldview) and how concepts such as trauma and adversity can be understood in this context.

Initially, two interviews (one to inform the interview schedule and a second to contextualise the findings) with the key informants were planned. However, following data analysis of the participant interviews, in consultation with the research supervisors, it was decided the second interviews were not required.

Utilising a purposive sampling approach, a list of potential key informants who met the above inclusion criteria was developed by the researcher. Following ethical approval, four key informants were approached directly via email inviting them to participate in the research (which included the key informant information sheet; Appendix A). All four key informants responded positively and agreed to participate in the research. One key informant interview commenced but was not completed due to interruptions, with the data gathered being destroyed and not included in this research.

Profile of key informants

Three key informants participated in the research (more information about their backgrounds is included in Chapter Four). Two key informants had detailed knowledge of a neurodevelopmental lens through their work with the NMT, with one having knowledge of its use in Aotearoa New Zealand and the other internationally. The other key informant was a very experienced and respected tangata whenua (indigenous Māori) social work leader who has a strong understanding of te ao Māori and the wider care and protection system. None of the key informants were working for Oranga Tamariki at the time of their interviews.

Social worker interviews

To answer the research questions, social workers with familiarity with the topic were identified as being the intended participants. Participant inclusion criteria were set to ensure

participants had enough requisite knowledge of the topic. The participant inclusion criteria required participants to:

- Be a registered social worker;
- Have familiarity with the care and protection system but not be employed at Oranga Tamariki at the time of participating in the research;
- Have at least three years of experience working with children; and
- Have an interest in how child development and neurodevelopment are affected by trauma, maltreatment, and abuse.

Following ethical approval, invitations to participate (which included the participant information sheet; Appendix B) were sent to social workers by email via intermediaries[18]; namely the Aotearoa New Zealand Association of Social Workers (ANZASW), which is the professional association for social workers in Aotearoa New Zealand[19] and the Neurosequential Network to those in Aotearoa New Zealand who had completed training in NMT.[20] Interested social workers then contacted the researcher directly to indicate their interest in participating. There was an overwhelming response to the invitation to participate, with over 20 positive responses in a two-week period. Only 10-12 social workers were required for the research, so those who met the inclusion criteria were included on a first-come basis. The sample size was determined in consultation with the doctoral research supervisors with consideration for the scope and size of the doctoral research project. Purposive sampling techniques typically suggest around 12 interviews are required for data saturation to occur (Emmel, 2013; Guest et al., 2006). Once the 12 participants were identified, those not selected were thanked for their interest and asked if their details could be retained in case further participants were needed. An interview was not able to be arranged with one social worker. A

[18] An NGO was also approached to distribute the research invitations, but the required number of participants was met before this was sent and so the invitation was not sent.
[19] I was the Kaiwhakahaere Chief Executive of ANZASW from 2021 to 2023. I was not employed by ANZASW at the time of participant recruitment or interviews, which were completed in 2020.
[20] The Neurosequential Network provides training and certification in the NMT.

replacement participant was not sought as 11 participants had agreed to be interviewed and this was within the desired number of participants.

It was initially intended that social workers who worked for Oranga Tamariki would be recruited through ANZASW; however, approval was required from Oranga Tamariki for any of their employees to participate. An application was submitted to the Oranga Tamariki Research and Data Access Committee for consideration. Unfortunately, Oranga Tamariki declined the application, meaning that anyone employed by Oranga Tamariki was unable to participate in the research. This is a limitation of the research and is discussed further in the limitations section of this chapter.

Profile of social workers

Eleven social workers who met the inclusion criteria participated in this research, and more information about their background is included in the findings chapter (Chapter Five). The social workers had between five and 40 years of experience within the field. All had undergone training in relation to trauma or a neurodevelopmental lens. They were located throughout Aotearoa New Zealand in both urban and rural settings, and in a range of organisations that work with children who have received care and protection services. Some had previously worked for the statutory child protection agency and so their previous experience in statutory social work slightly alleviates the limitation of not being able to speak directly with current statutory social workers.

Data collection

Given this research explored how child protection social workers use a neurodevelopmental lens to understand and address childhood adversity, a qualitative approach was an appropriate method for data collection for this practice research. Qualitative interviews allowed for a detailed exploration of how social workers view and understand practice in this

area. Semi-structured, qualitative interviews utilise a pre-prepared interview schedule but allow for follow-up questions or prompts to be used for the flexible exploration of the topic and for any relevant tangents or new ideas to be explored in detail (Bell, 2010; Elliot & Timulak, 2005). This was much preferred over a quantitative approach, which would not have enabled an in-depth understanding of the research topic (Pain, 2011).

Key informants

As discussed previously, the key informant interviews provided a deeper understanding of the topic and contextualised the literature in an Aotearoa New Zealand context and the findings were therefore integrated with the literature in Chapter Four (Taylor & Blake, 2015). An interview schedule was prepared based on the research questions, literature review, and in consultation with the research supervisors (Appendix C). Interview questions were written to be open questions to elicit the key informants' views, with some prompt questions to elicit further information. Broad questions were selected to elicit a discussion about the neurodevelopmental lens, trauma, and adversity. The theoretical framework informed the interview schedule through the inclusion of questions relating to both risk and protective factors as they both contribute to development according to the ecological-transactional perspective (Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019). The framework also included questions to explore the key informants' views on the impact of structural forms of adversity (such as poverty and being from diverse cultural backgrounds). The interview schedule had specific questions based on the key informants' expertise (neurodevelopmental and/or Māori cultural knowledge).

The key informant interviews were conducted online between March and June 2020, with initial data analysis occurring before the social worker interviews commenced. A fourth key informant commenced an interview for 15 minutes but was interrupted; it was not possible to arrange another time and so their participation in the research was ended, with the data collected not being included and destroyed.

Social workers

A similar approach described for the key informant interviews was adopted to develop the participant interview schedule (Appendix D). The interview schedule was informed by the findings from the key informant interviews, literature, and an ecological-transactional perspective to consider broader system impacts on development, and both risk and protective factors. Open-ended questions were utilised to elicit rich data from the participants about their views of and experience with the neurodevelopmental lens. The interview schedule included questions about how the participants used the neurodevelopmental lens in practice, the impact of adversity (including structural forms of adversity), what the participants considered were protective factors, and how the lens informed their selection of interventions. Additionally, questions were written which explored the participants' views about how their use of a neurodevelopmental lens with Māori clients. Following analysis of the key informant interviews, the interview schedule was refined slightly (for example, including a question about how supervision supports participants' use of the neurodevelopmental lens). The interviews with the social workers were all completed in July 2020.

Allowances for COVID-19

Data collection for this research was conducted during the peak of the COVID-19 pandemic. All interviews were conducted via Zoom. Given the stress of the pandemic and the possible stress of participation in this research, the researcher paid particular attention to the participants' emotional state during the interviews and was prepared to end the interview, if required (this was not required).

Data collection process

Interviews were completed with key informants and social worker participants. This discussion on data collection applies to the key informant and social worker interviews. Before

the commencement of all interviews, the purpose of the research, information sheet, and rights were explained, and interviewees were given an opportunity to ask questions before signing the relevant consent form (Appendices E and F). All interviews were conducted using Zoom technology in a password-protected meeting room and lasted between 60 and 90 minutes.[21] Interviewees were asked to ensure they had a private space that was free from distractions and where they could speak comfortably and freely.

The researcher took notes as the interviews progressed and after the interview concluded. The notes captured key thoughts, feelings, and areas for follow-up and possibly further investigation. Field notes can be useful to capture contextual data and researcher impressions at the time of the interviews to supplement language-focused data (Phillippi & Lauderdale, 2018). The field notes encouraged reflection on the interviews by the researcher and supported preliminary coding (Phillippi & Lauderdale, 2018).

Audio recordings of the interviews were made with the key informants' and participants' consent and transcribed verbatim following the interview. Key informants and participants were asked to check their interview transcription and provided an opportunity to make alterations to their transcript. Two participants made changes to their transcript. Key informants and participants were also asked to sign the release of transcript authority form (Appendix G). They were able to withdraw from the research until they signed the transcript authority release form. Withdrawing from the study would have ended their participation in the research and their data would be destroyed and not used in the research. Copies of the recordings and transcripts were stored on the researcher's password-protected OneDrive and were deleted from the recording devices once they were stored on OneDrive. Physical documents related to the research were stored in a locked location, only accessible to the researcher.

[21] Except for the one key informant interview whose interview was not able to be completed and the data gathered was excluded from this research.

Data analysis

Braun and Clarke's (2006, 2022) method of thematic analysis was utilised in this research to identify and analyse themes in the data for both the key informant and social worker interviews. Thematic analysis was utilised within this research given its congruence with practice-based research. Analysis of the key informant interviews was completed before the social worker interviews and informed the interview schedule for the social worker interviews. The interviews were initially analysed using an inductive process where the themes emerge out of the data to build the rich understanding and contextualisation sought (Azungah, 2018; Bingham & Witkowsky, 2022; Watkins & Gioia, 2015). This process of thematic analysis includes a number of steps, as articulated by Braun and Clarke (2006, 2022):

- Firstly, familiarity with the data was achieved through actively engaging with the interviews by listening to the recordings, reading the transcripts of the interviews several times, and reviewing notes made at the time of the interview.
- Secondly, the data was coded. Codes were developed by reading the data and labelling the data with relevant words and key ideas (i.e., development happens through experience and connection to culture). NVivo software was utilised to assist with data coding by tagging lines of text with relevant codes.
- Thirdly, initial themes were generated by grouping similar codes together to identify patterns across the dataset (for example, working collaboratively). Post-it notes were utilised to map out the codes and group together similar codes.
- Next, the themes were developed and reviewed. This involved reviewing the themes to ensure they reflected the data through discarding, re-grouping, combining, and occasionally splitting themes (for example, the importance of relationships was initially placed as a sub-theme under brain development, but through reviewing the data, this became a key theme). This occurred through grouping the themes in Nvivo and reading through the data for each theme to check for consistency.

- Finally, themes were refined, defined, and named. The themes were reviewed again to ensure they were accurate, with brief descriptions for each theme being developed before they were named to identify the essence of the theme; for example, *attachment relationships, connection, and belonging*.

Following the inductive process of thematic analysis, the data was reviewed again in a deductive manner. Deductive analysis, when used following an inductive analysis process, allows for the application of a theoretical framework and analysis of the data with key concepts from the literature in mind (Azungah, 2018; Bingham & Witkowsky, 2022). As previously discussed, the research drew on an ecological-transactional perspective. Using the levels of the ecological-transactional perspective (individual, micro, meso, exo, and macrosystem levels) the themes were grouped in Chapter Six (the discussion) into the most appropriate position in the framework. It was noted that some themes identified in this research described the interaction between two levels; for example, experience shapes development is the interaction between the individual and their environment (i.e., the micro, meso, exo, and macrosystem levels). In these situations, the themes were identified in the most logical position (for example, in the preceding example the theme was located at the individual level of the ecology). Following the grouping of the themes, the data was reviewed again with the key concepts of the neurodevelopmental lens from the literature in mind to check if any other themes emerged; none were identified.

Analysis is an ongoing and iterative process, which includes the writing process (Braun & Clarke, 2022). As the researcher engages with the literature whilst writing, they can be prompted to revisit and check analysis of the data. Critical reflection is central to ensuring the appropriate application of practice theories and critical reflection, often through discussions with the research supervisors, was used throughout this thesis (Braun & Clarke, 2022).

Ethical considerations

The research was conducted in accordance with Massey University's (2017) *Code of Ethical Conduct for Research, Teaching, and Evaluation Involving Human Participants*. The research was informed by the ethical values of autonomy, non-maleficence, privacy and confidentiality, beneficence, justice, and Te Tiriti o Waitangi obligations. Social workers in Aotearoa New Zealand must also adhere to their *Code of Ethics* (ANZASW, 2019) and *Code of Conduct* (Social Workers Registration Board, 2018) when undertaking research. These were also considered in the design of this study.

The key informant interviews were assessed as ethically low risk, and so a low-risk notification was made to Massey University's Human Ethics Committee for these interviews (see Appendix H). A full ethics application was granted (SOA 20/04) by Massey University's Human Ethics Committee for the participant interviews (see Appendix I).

Autonomy

The ethical principle of autonomy ensures that people have the right to make their own decisions about involvement in research, without influence or coercion (Hardwick & Worsley, 2011; Massey University, 2017). There are several components to informed consent: agency, information, comprehension, and absence of pressure, manipulation, or coercion (Massey University, 2017). Agency refers to the capacity of the individual to make an informed decision. In this research, the key informants and social worker participants were all qualified professionals with the agency to make informed decisions. The second component of autonomy requires providing clear, understandable, and comprehensive information to allow individuals to make an informed decision to participate in the research (Hardwick & Worsley, 2011). In this case, information sheets were prepared (Appendices A and B) and provided to all participants which outlined the purpose of the research, the rights of participants, and any potential impacts from participating in the research. Participants were provided with an

opportunity to have questions answered before participation. The final component of autonomy is the absence of pressure, manipulation, or coercion (Hardwick & Worsley, 2011; Massey University, 2017). No coercion, manipulation, or pressure to participate occurred. Key informants were contacted directly by the researcher without any coercion or pressure to participate, and all responded positively on the first contact. Social workers were invited to participate through an intermediary, and they contacted the researcher directly of their own volition thereby ensuring the confidentiality of participation from the intermediary. Participants and key informants could withdraw from the study at any stage until they had signed the release of the transcript form.

Non-maleficence

Non-maleficence refers to the avoidance of harm in research processes (Hardwick & Worsley, 2011; Massey University, 2017). The research topic was focused on childhood adversity, which includes the experiences of trauma and abuse; given this, there was the potential for participants to become upset or to have an emotional reaction to the interview topics. There was also a risk that participants may experience vicarious trauma. Vicarious trauma is the cumulative change in schemas or beliefs through exposure to traumatic materials (Knights, 2017). If the participants became upset, had an emotional reaction, or demonstrated signs of possible vicarious trauma because of the interviews (this did not occur), the interview would have been halted, support provided, and they would have been encouraged to seek professional supervision and support from a list of support agencies provided to them. Furthermore, should the participants have disclosed immediate risk to a child or family (which did not occur), the interviewer would have concluded the interview and asked the participant to speak with their supervisor and follow their organisation's child protection policy.

Privacy and confidentiality

Harm can also be caused by breaches of privacy. Participants have the right to expect that their privacy is respected and that they have autonomy over any decisions made about their privacy (Hardwick & Worsley, 2011). Confidentiality, anonymisation, and participant editing were used to protect participants' privacy (Hardwick & Worsley, 2011). The nature of qualitative research means the identity of participants is not anonymous to the researcher. Pseudonyms were used to ensure a participant's privacy and any identifiable data anonymised (for example, removing the names of organisations). Due to the key informants' specialist knowledge and expertise in the approach, there is a risk people may assume or guess their identities. This was highlighted to the key informants and participants in the information sheet and discussed at the start of each interview.

The data gathered from this research will not be used for any purposes other than the research and subsequent publications. Participants were provided with the opportunity to check and edit their transcripts. Data was stored on a password-protected laptop or in a locked filing cabinet, with the researcher being the only person with access to the data. Project data will continue to be securely stored for a minimum of six years following examination of this thesis to allow for further publications to be completed, before being destroyed.

Beneficence

Beneficence refers to research providing benefits to the participants, including broader society (Hardwick & Worsley, 2011; Massey University, 2017). This research had the potential to be of benefit to participants as it provided them with an opportunity to reflect on a specific aspect of their practice; several of the participants commented on this at the conclusion of their research interview. They may have deepened their critical awareness of the benefits and use of the neurodevelopmental lens in practice. Once the research has been examined, key informants and participants will be sent a summary of the key findings and will be offered an

electronic copy of the full thesis. Moreover, the research is beneficial to the wider social work profession and other professionals using the neurodevelopmental lens, as it deepens understanding and provides recommendations to enhance practice. The research intends to produce new knowledge, with hopefully some resultant changes in practice.

Justice

The principle of justice ensures that the research is fair and just, and there is an equitable distribution of benefits and burdens (Hardwick & Worsley, 2011). This principle requires fair access to participate in the research. This was achieved through having clear participation criteria and adopting a first-come approach to participation (where participation criteria were met). This reduced any biases in participant selection and ensured equitable distribution of benefits and risks of the research.

Te Tiriti o Waitangi articles and obligations

The articles of Te Tiriti o Waitangi must be upheld in all Aotearoa New Zealand research (Massey University, 2017; Pūtaiora Writing Group, n.d.). The research explored child protection social work practice in Aotearoa New Zealand. Māori are significantly overrepresented in Aotearoa New Zealand's child protection population (Oranga Tamariki, 2019; Rebstock et al., 2015b). A key part of the research was seeking a key informant who had expertise in te ao Māori to provide guidance and ensure te ao Māori concepts were understood and appropriately used and contextualised. The key informant helped me work through how te ao Māori concepts related to the neurodevelopmental lens and identified tensions, differences, and potential conflicts in the use of the lens in practice. Aotearoa New Zealand registered social workers are required to be culturally competent to work with Māori (Social Workers Registration Board, 2017). The participants and researcher were all registered social workers and, therefore, were required to be competent to work with Māori.

Methodological limitations

The research focused on social workers' perspectives and sought to explore how social workers understand and address childhood adversity using a neurodevelopmental lens. A qualitative approach was appropriate for this study as it enabled a deep understanding of participants' perspectives. The study does not evaluate the effectiveness of a neurodevelopmental lens nor how children and their families experience social work practice where a neurodevelopmental lens is adopted. These are important areas for future research and it is recommended a rights-based narrative approach is used for this future research (McNamara, 2011).

The research may be limited through the purposive sampling method adopted, which could result in only those interested in the topic participating in the research. The participants' views may not represent the broader social work workforce. It is noted that this is a possibility. However, there was a very strong interest in the research following one email advertisement to ANZASW members and the Neurosequential Network (which resulted in all the participants being recruited), suggesting there may have been a growing interest in the research topic. Similarly, the inability to recruit current statutory social workers is another possible limitation. However, participants had frequent contact with statutory services, and some participants had previous statutory social work experience. This somewhat mitigates this limitation.

This research sought to increase its trustworthiness by adopting several strategies recommended by Lietz and Zayas (2010). Reflexivity was achieved through utilising field notes. Thick descriptions of data were used purposely to ensure a thorough representation of the neurodevelopmental lens. This chapter has clearly documented the research process followed to establish an audit trail. Finally, the doctoral research supervisors supported the research process (referred to as peer debriefing by Lietz & Zayas, 2010). Together, these strategies support the trustworthiness of this research.

Chapter summary

This research sought to understand how child protection social workers apply the neurodevelopmental lens to understand and address childhood adversity. This chapter has outlined the methodology and methods adopted. The research drew on a practice research methodology, which seeks to inform and change practice. It was informed by an ecological-transactional perspective as the theoretical framework. Qualitative, semi-structured interviews were undertaken with key informants and social workers, who were recruited using a purposive methodology. Reflexive thematic analysis was utilised to analyse the data. Ethical issues were presented and discussed. Finally, the methodological limitations of the research were articulated. The next chapter discusses child protection practice theory, how trauma-informed approaches are used internationally and in Aotearoa New Zealand as a practice theory, and the use of neuroscience in social work practice.

Chapter Three: Trauma-informed approaches and neuroscience in social work practice

The previous chapters have provided a foundation for the research by introducing the research and outlining the methodology, theoretical framework, and methods used in this research. This chapter and the next review the relevant literature relating to addressing adversity in child protection social work and the neurodevelopmental lens and present the findings from the key informant interviews alongside the literature (Chapter Four). The focus of this chapter is to present a background to the neurodevelopmental lens by introducing practice theory, trauma-informed approaches, and the use of neuroscience in child protection social work. This chapter will lay a foundation for the neurodevelopmental lens (discussed in detail in the next chapter) and highlights the need for the critical adoption of neuroscientific knowledge in social work practice.

The chapter begins by discussing assessment and intervention practice theory in child protection social work. Then, it discusses TIP and its use as a practice theory in Aotearoa New Zealand and internationally. The discussion highlights definitional issues with trauma and justifies the use of the term adversity in this research. Debates relating to the use of neuroscience within social work are critically analysed. The discussion highlights the importance of locating neuroscientific knowledge within an ecological framework.

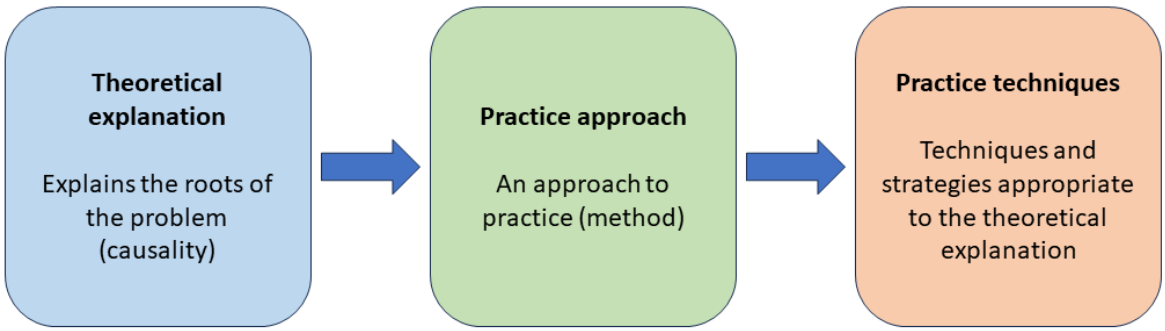
Practice theory in child protection social work

Practice theory is central to social work. Payne (2020) defined a theory as "a generalised set of ideas that describes and explains our knowledge of the world in an organised way" (Payne, 2020, p. 6), elaborating that a social work practice theory "describes and explains what actions to take when doing social work" (Payne, 2020, p. 6). In broad terms, assessment within social work is a process whereby the social worker gathers information, analyses and seeks to

understand this knowledge, drawing on professional knowledge, makes judgements about risk and safety, and decides on a plan moving forward (Milner et al., 2015). Throughout the assessment process, social workers draw on theoretical perspectives to analyse the client's circumstances and identify the most appropriate intervention methods to bring about change (Harms & Maidment, 2017; Milner et al., 2015; Payne, 2020). Practice theories provide a full picture of the roots of the problem and an approach to addressing it (Harms & Maidment, 2017; Payne, 2020). Harms and Maidment (2017) provide an explanation for how theory translates into intervention with clients: "In explaining the roots of the problem (causality), a theory suggests an approach to practice (method) and will often supply techniques that are consistent with the theoretical explanation" (Harms & Maidment, 2017, p. 5), which is visually illustrated in Figure 3. Social workers then work with the client (which may include making appropriate referrals to others more suited to address a particular issue), drawing on the strategies and techniques appropriate to the theoretical perspective.

Figure 3

The shift from theoretical explanation to practice techniques



Note: Adapted from Harms and Maidment (2017) and Harms and Connolly (2019).

Child protection social work practice is mandated by legislation to ensure the safety and well-being of children, typically working with children up to 18 years old in Aotearoa New Zealand.[22] Often, child protection systems become involved with a child and their family following a report of concern to the local child protection authority (Oranga Tamariki in Aotearoa New Zealand). As discussed in Chapter One, the child protection authority then assesses (sometimes referred to as investigates) the report of concern. If significant concerns for the safety or well-being of the child exist, intervention may occur. Interventions within the child protection system can range from informal, voluntary interventions to more formal interventions, such as seeking court orders to remove a child from their parent(s) or caregiver(s).

The child protection population is a particularly vulnerable group, with high rates of abuse, neglect, maltreatment, poly-victimisation, and poverty (Richardson et al., 2008; Rouland & Vaithianathan, 2018; Tregeagle et al., 2019). These experiences have been linked with a range of negative impacts, including increased risk of psychiatric and health conditions and neurocognitive, social, and developmental delays (Cook et al., 2005; Kavanaugh et al., 2017; Richardson et al., 2008; van der Kolk, 2014). These impairments are long-lasting and result in poor long-term health and social consequences (Sege & Amaya-Jackson, 2017). At a population level, poorer long-term health, mental health, and behavioural and social outcomes have been found to be related to the greater number of adverse experiences a child has experienced (Anda et al., 2006; Felitti et al., 1998). The impact of childhood adversity is said to be wide-ranging across numerous domains. Cook et al. (2005) highlighted that complex trauma affects children in the domains of attachment, biology, affect regulation, dissociation, behavioural control, cognition, and self-concept. A holistic approach to children and young people within the child protection system is, therefore, needed to support those

[22] In some circumstances, child protection social workers may work with young people up to the age of 25 as they transition out of state care.

children who have had sustained exposure to ACEs (Featherstone et al., 2017; Featherstone et al., 2018; Ungar, 2005).

A cohesive practice theory gives social workers the necessary theoretical explanation, practice methods, and appropriate techniques and strategies to help them understand and address the impacts of childhood adversity (Payne, 2020). The discussion now turns to briefly discussing definitional issues relating to trauma before a critical review of TIP and how it contributes to understanding and addressing the impacts of childhood adversity.

Trauma-informed practice

In recognition of the impacts of adversity, child protection systems have adopted trauma-informed approaches to improve the well-being and outcomes of children. While TIP and trauma-informed care (TIC) are often used interchangeably, TIP relates to clinical intervention, whereas TIC refers to organisational structures (Dyer & Chisnell, 2023; Knight, 2019; Levenson, 2020). Trauma-informed approaches draw on a strengths-based perspective to understand and respond to the impacts of trauma, including the neurobiological impacts (Boese, 2020; Levenson, 2017, 2020; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014, p. 10). Trauma-informed approaches draw on several principles and elements which are outlined in Table 1 below (Dyer & Chisnell, 2023; Knight, 2019; SAMHSA, 2014).

Table 1

Principles and elements of trauma-informed approaches

Trauma-informed principles	Trauma-informed elements
• Safety • Trust • Empowerment • Choice • Collaboration	• *Realise* the impacts of trauma. • *Recognise* the signs and symptoms of trauma. • *Respond* to trauma by activating knowledge into practice and policies. • Actively *resist re-traumatising* individuals.

TIP and TIC are increasingly being used within the fields of mental health, substance abuse, health settings, and child protection and youth justice systems (Te Pou o te Whakaaro Nui, 2018). Several authors have argued that trauma-informed approaches are highly relevant for social work practice as they recognise the impacts of adversity on individuals (the person-in-environment perspective) whilst also allowing the exploration of the impact of structural factors, such as poverty and oppression (Boese, 2020; Dyer & Chisnell, 2023; Knight, 2015, 2019; Levenson, 2017, 2020). However, this perspective appears to be contentious with other scholars (Reynolds, 2020; Wirihana & Smith, 2014) arguing that the term trauma results in an individualistic, medicalised focus.

Definitional issues: trauma vs adversity

The concept of trauma has multiple definitions and interpretations, leading to challenges with definitional clarity (Bath, 2017; Marlowe & Adamson, 2011; Ungar & Perry, 2012). Current definitions focus on events (which can include the subjective experience or response to the event) that cause serious harm or overwhelm an individual's capacity to cope (Bath, 2017). For example, the DSM-5 defines traumatic events (in the context of post-traumatic stress disorder

triggers) as being exposure to actual or threatened death, serious injury, or sexual violation, which the individual directly experiences, witnesses in persons, or learns about occurring to a family member or close associate (American Psychiatric Association, 2013). Alternative definitions have focused on the individual's ability to cope following an experience (Bloom & Farragher, 2011; Ungar & Perry, 2012). These psychological and psychiatric definitions of trauma aim to provide diagnostic utility by focusing on event-based and individualistic definitions (Wirihana & Smith, 2014).

These definitions of trauma are problematic for social work. The individualistic focus, draws on medical terminology, centres the blame for poor adaptation on the individual, pathologising the individual (Reynolds, 2020). Structural forms of violence and oppression (such as poverty, ableism, ongoing colonial violence, heteronormativity, cisnormativity, and racism), the ecological environment, culture, and the manner within which human experience is constructed are hidden (Beddoe et al., 2019; Marlowe & Adamson, 2011; Reynolds, 2020; Wirihana & Smith, 2014). The psychological and psychiatric conceptualisations of trauma do not capture trauma which can be considered to be long-term chronic and complex, including collective trauma, such as historical trauma through colonisation (Brave Heart, 2000; Pihama et al., 2014; Wirihana & Smith, 2014), or the chronic stress of living with family violence, parental mental illness, or substance abuse (Bath, 2017). Social work "engages with people *and* structures to address life challenges and enhance wellbeing" (emphasis added; IFSW & IASSW, 2014). Therefore, the exclusion of structural factors from the individualistic definitions of trauma are incongruent with a social work perspective.

A conceptualisation of trauma which considers structural factors may, therefore, be useful as it aligns with the profession of social work. One such approach which attempts to do this is the concept of adversity. McLaughlin (2016) defined childhood adversity as "exposure during childhood or adolescence to environmental circumstances that are likely to require significant psychological, social, or neurobiological adaptation by an average child and that represent a

deviation from the expectable environment" (McLaughlin, 2016, p. 363). McLaughlin's conceptualisation of adversity includes several important components. Firstly, the inclusion of the expectable environment allows for the consideration of broader ecological structures and challenges, including the structural forms of violence and oppression outlined in the preceding paragraph. Secondly, the phrasing of adaptations serves as a reminder that children adapt to their environment and experiences of adversity. This framing positions adaptations as appropriate responses and resistance to forms of harm and violence, rather than pathological deficits of the individual's ability to cope (Coates & Wade, 2007; Reynolds, 2020; Wade, 1997). Thirdly, McLaughlin's conceptualisation is broader than (and not to be confused with) ACEs, which are a list of prescribed adverse factors used for epidemiological studies (discussed further below). Some authors have argued that the ACEs questionnaire should not be used as a standalone framework for considering adversity in practice (Finkelhor, 2018; Joy & Beddoe, 2019; White, Edwards, et al., 2019). Finally, the definition recognises that children may respond to adversity in a variety of different ways (De Bellis et al., 2009; Jones & Rowland, 2017; McKelvey et al., 2017; Parish et al., 1985; Te Pou o te Whakaaro Nui, 2018). McLaughlin's definition has been adopted in this study as it allows for a broad exploration of adversity (particularly structural factors) and a variety of forms of adaptation, responses, and resistance to adversity.

The definitional challenges relating to the concept of trauma, particularly the individual focus of trauma, have been criticised by scholars and may contribute towards challenges in implementing trauma-informed approaches. This is now discussed further.

Implementation challenges with trauma-informed approaches

Internationally, trauma-informed approaches have been implemented within various child protection systems, mostly throughout the United States. The implementation of TIC has been supported by:

- building awareness and capability in the workforce (including foster carers) through delivering training and reducing the impact of traumatic stress;
- supporting the use of trauma-focused services through implementing routine screening and assessment and referrals to evidence-based treatments for trauma and mental health systems; and
- strengthening organisations through policy changes, collaboration with key partners, leadership, and continuity of care across the system (Akin et al., 2017; Bartlett et al., 2016; Lang et al., 2016).

However, within the extant literature, there is diverging consensus on how trauma-informed approaches should be implemented. A systematic review of the literature by Branson et al. (2017) found limited consensus on practices and policies as to how trauma-informed approaches should be implemented. Leitch (2017) wrote, TIC "is primarily a set of information and values about working with individuals who have experienced trauma. This is an important framework that has promoted better working alliances and an empowerment focus but has not provided enough intervention-oriented guidance" (Leitch, 2017, p. 3). Leitch goes on to elaborate that TIC often provides an understanding of the impact of trauma and why someone may be dysregulated, however, it does not provide a pathway to support them in healing. Leitch argued for a greater focus on resilience, strength, and protective factors, along with drawing on neuroscientific knowledge to develop a stronger practice theory.

The findings from Branson et al. (2017) and Leitch's (2017) analysis resonate with Atwool's (2019) observations on the dearth of research and commentary on how trauma-informed approaches should be implemented within child protection systems. Atwool also highlighted the inherent tensions within child protection work where "social workers are uninvited intruders with a responsibility to assess the safety of the family" (Atwool, 2019, p. 27) which is juxtaposed against the role social workers play as a facilitator within trauma-informed approaches. Atwool contends there is a need to clearly define what TIP means within child

protection systems and suggests an ecological framework is required to ensure the approach is implemented at all levels of the child protection system rather than the focus being solely on practice at an individual level.

Atwool's (2019) analysis of a trauma-informed approach and the need to include an ecological framework addresses a concern about TIC. The trauma-informed focus on the individual and their immediate surroundings has been criticised in the literature as this approach can result in pathologising the individual (Hyslop & Keddell, 2018; Leitch, 2017; Pihama et al., 2017; Tudor, 2023), which may be driven by the conceptualisation of trauma (as outlined above). Broader societal and structural influences on the individual and their surroundings, such as poverty, intergenerational trauma, and colonisation, are at risk of not being fully considered (Pihama et al., 2017; Tudor, 2023). Interestingly, similar critiques exist of child protection systems with the argument being that they focus on risk factors and individualising problems without fully considering the wider ecological systems and the societal impacts of marginalisation or inequality (Featherstone et al., 2017). Atwool's suggestion of developing combined trauma-informed and ecological approaches has merit, especially for use within child protection systems. Atwool's approach may provide a framework within which the impacts of broader societal factors, including historical trauma, can be considered.

The challenges of defining TIP within child protection systems may have led to the apparent challenges with its implementation. For example, in Massachusetts, Barto et al. (2018) compared locations where TIC had been implemented with areas where it had not yet been implemented. The study found that for children who encountered the child welfare system in the study period, the TIC group had fewer substantiated reports of maltreatment; however, they had more reports of concern overall and, concerningly, more out-of-home placements than their counterparts (Barto et al., 2018). In another Massachusetts study, whilst reductions in trauma symptoms and behavioural challenges were found following six months of evidence-based treatment, there remained challenges with implementing TIC (Bartlett et al., 2016).

These challenges included scarce resources and few providers offering trauma-informed services, particularly to young children. Overall, the effectiveness of TIC is still unclear and requires further research.

A further potential reason for some of these mixed findings may be due to the emphasis placed on routine screening and referrals for evidence-based interventions. Typically, brief screening tools, such as the Strengths and Difficulties Questionnaire (SDQ), Child Behaviour Checklist or the Brief Assessment Checklist (Conradi et al., 2014; Conradi et al., 2011; Mildon et al., 2015; Tarren-Sweeny et al., 2019), are used to identify children who may need further assessment for possible mental health disorders. These screening tools may hold some utility in the identification of mental health needs and challenges for young people and have been found to have greater effectiveness than an unstructured assessment (Tarren-Sweeny et al., 2019; van Rooij et al., 2019). However, these screening tools must be used with caution. In a mixed methods United Kingdom study, Wright et al. (2019) found the SDQ, when completed by parents or young people themselves, lacked discriminatory accuracy in determining those children who required mental health treatment and those who did not. Wright et al. concluded that there are several problems with using the SDQ as a screening tool, and it should only be used as part of broader clinical assessments. They noted the SDQ was designed to identify common mental health diagnoses and not the complex challenges that arise from developmental trauma and/or attachment difficulties. It also has limited utility in identifying emotional difficulties, a common feature in the child protection population. Overall, screening tools, such as the SDQ, do not provide a nuanced understanding of the child and their strengths and challenges or inform subsequent intervention planning. These findings are consistent with a review of the SDQ in the Aotearoa New Zealand context, where questions were raised about the cultural appropriateness of the tool and this may have resulted in different answers being provided by parents or teachers completing the tool (Kertsen et al., 2014). Several studies have demonstrated that the identification of needs through standardised screening is likely to result in service provision for some young people but it does

not mean that the recommended support to meet these needs is implemented for every child or young person, with many not receiving the services they need (Baker et al., 2017; Devaney et al., 2023; Petrenko et al., 2011; Pullmann et al., 2018). Standardised screening tools may result in some increased support to meet needs, but they need to occur within the context of a holistic approach to assessment (Ai et al., 2013; Devaney et al., 2023; Tarren-Sweeny, 2013; Wright et al., 2019). It may be that social workers view trauma screening as a task to do, versus using it as a tool to assist their formulation and intervention planning.

Some researchers have argued that the standardised use of screening and evidence-based interventions (such as those in trauma-informed approaches) poses problems as a neoliberal agenda drives it (Harlow et al., 2012; Henrickson & Fouché, 2017; Kelly, 2017; Ornellas et al., 2020). As an ideology, neoliberalism believes in a small state sector, which results in attempts to increase efficiency within public services through an approach known as managerialism (Henrickson & Fouché, 2017; Wacquant, 2010). Managerialism focuses on managing risk and being highly efficient, often at the cost of undermining a client's holistic well-being; moreover, structural inequalities are not addressed and challenged (Harlow et al., 2012; Noble & Henrickson, 2014; Ornellas et al., 2020; Trevithick, 2014). The enforcement of standardised practice across clients is problematic for social workers as it minimises the individual nature of the person, and instead seeks to fit the person into the organisation's models and ways of working (Diaz & Drewery, 2016; Grady et al., 2018; Munford & Sanders, 2011). The highly prescriptive and standardised approach of evidence-based practices (such as trauma-focused cognitive behaviour therapy [TF-CBT]) limits the practitioner's ability to be able to work with the person in their environment (Blau, 2017). Social work has predominantly been a reflexive practice; that is, the social worker adjusts their practice based on the person, their environment, and the interactions between the two (drawing on an ecological systems approach), which includes adjusting their practice in a culturally appropriate manner (Payne, 2014). The prescriptive nature of evidence-based practices and standardised screening takes away from the reflexive nature of social work and does not allow for nor supports a holistic

exploration of the person and their environment. A broad exploration of an individual's current functioning, family and developmental history, exposure to childhood adversity, issues and strengths of the child, and their interaction within other systems, such as education, is more appropriate to inform the effective selection of interventions (Conradi et al., 2014; Mildon et al., 2015).

The discussion will now turn to briefly exploring the history of TIP in Aotearoa New Zealand.

Trauma-informed practice in Aotearoa New Zealand

Since the 1980s, the Aotearoa New Zealand child protection system has undergone numerous reviews and reforms which have identified strategies for improving outcomes for children and families, especially Māori and Pacific people who are disproportionately represented in child protection services. Several Aotearoa New Zealand scholars (Fitzmaurice-Brown, 2023; Hyslop, 2022; Keddell et al., 2022) have provided commentary on the reviews and reform. Most of the more recent reviews have focused on the role of the state in the decision-making for children and their families, particularly in relation to the removal of children. However, the 2015 Expert Advisory Panel review (Rebstock et al., 2015a, 2015b) focused on the poor outcomes of children involved with the care and protection system (as discussed in Chapter One). The review found poorer outcomes (compared with those who had no contact with the care and protection system) for children who encountered the child protection system (Rebstock et al., 2015b). By the time they were 21 years old, they were more likely to have received a benefit, been involved with the criminal justice system, and left school with fewer qualifications than those who had no contact (Rebstock et al., 2015b). This review recommended the child protection system develop a TIP approach in order to improve the longitudinal outcomes for those involved with the care and protection system (Atwool, 2019; Rebstock et al., 2015a).

The focus on a child-centric, trauma-informed approach is likely to have been driven by a social investment approach and the neoliberal agenda of the 2008-2017 National-led government of the time (Hyslop & Keddell, 2019). The social investment approach sought to reduce the burden on the state of poor outcomes through early intervention and using evidence-based policy (Acquah et al., 2019; Hyslop & Keddell, 2019; Keddell & Davie, 2018). Keddell (2018) explained a social investment approach:

> Children are seen as potential citizens of the future, and investment is positioned as required in order to equip them for an economically productive future… In a social investment state, children are seen as fundamental to any social investment strategy success, as the projected costs over a lifetime are assumed to be avoidable if investment is early enough in the lifespan. (Keddell, 2018, p. 102)

The Aotearoa New Zealand social investment approach was more risk-averse and privileged individualised child protection practice; this can lead to more removals of children from parents' care (Keddell, 2018).[23] Social investment approaches fail to consider (and address) the structural factors affecting children and families (Hyslop & Keddell, 2019; Keddell & Davie, 2018). Some scholars have argued that neoliberal ideology (such as Aotearoa New Zealand social investment approaches) results in the reinforcement of negative societal views of certain demographics of people (particularly of Māori in Aotearoa New Zealand) as posing an inherent risk to their children (Hackell, 2016; Joy, 2022). The poor outcomes and examples of child abuse and neglect of lower socioeconomic cohorts and Māori are used as a weapon against them to justify intervention into the lives of families (Hackell, 2016; Joy, 2022).

As alluded to above, the paradigm can lead to more resources and support (alongside family policing and surveillance) being made available to children in state care (due to the parental

[23] The Aotearoa New Zealand social investment model adopts an actuarial approach, aligning with neoliberal ideology. The Aotearoa New Zealand approach is different to European social investment models which are based on social development.

relationship the state has with them) in order to address their "damage" and ensure their future productivity (Keddell, 2018). It is argued that this is where the drive for TIP emerges – TIP is recommended to address the harm that was caused and to (hopefully) prevent them from being a future liability to the state. Whilst the cost-saving motivation for TIP is questionable under Aotearoa New Zealand's neoliberal social investment paradigm (a full critique and discussion of neoliberal ideology and the social investment approach is outside of the scope of this research), there is an important question to be asked: *how can the impacts of adversity be effectively addressed?*

Whilst the Rebstock et al. (2015a, 2015b) reports resulted in the rebranding (and to a lesser extent revitalisation) of the previous child protection department into Oranga Tamariki – Ministry for Children, there continues to be a lack of real progress towards trauma-informed approaches within the Aotearoa New Zealand child protection system (Atwool, 2019; Boese, 2020; Dyer & Chisnell, 2023). This may be because social workers have a limited understanding of how to implement TIP in practice (Boese, 2020; Dyer & Chisnell, 2023). Recent studies in Aotearoa New Zealand by Boese (2020) and Dyer and Chisnell (2023) both found that social workers were unclear on how to implement TIP within their practice. Furthermore, an Aotearoa New Zealand study by Beddoe et al. (2019) found some (but not all) newly qualified social workers reported not feeling prepared to work with trauma following the completion of their social work training. There was resistance to the introduction of trauma in social work training by social work educator participants in the study as they viewed it as a political trend. Instead, Beddoe and colleagues argued for the inclusion of multiple perspectives on social problems. Despite this, there remains a need for social workers to understand and address the impacts of trauma and adversity, particularly within child protection social work, as there can be long-term impacts on well-being.

The discussion now turns to the debates surrounding the use of neuroscience within social work practice.

Neuroscience and social work

Neuroscience is increasingly being used within social work practice (Beddoe & Joy, 2017; Munro & Musholt, 2014; Plafky, 2016), as research into the brain continues to expand rapidly. The field of neuroscience has expanded so rapidly in recent times that the 1990s are referred to as the decade of the brain (Wastell & White, 2012). Yet despite this, the field of neuroscience and how this applies to social work practice can still be considered an emerging field of research, or as one critical review referred to it being "still in the embryonic stage, if not that which precedes conception" (Belsky & de Haan, 2011, p. 410).

The increased use of neuroscientific evidence and explanations may be driven by the perception they are appealing, satisfying, and credible, particularly when neuroimages visually depict findings (McCabe & Castel, 2008; Weisberg et al., 2008). A study found that nonexperts judged explanations which included neuroscientific explanations as being more satisfying than those without a neuroscience explanation (Weisberg et al., 2008). Yet, the interpretation of neuroimaging requires skill and sophisticated technology (Munro & Musholt, 2014; Wastell & White, 2012). The general population typically does not possess the skills and knowledge to be able to interpret neuroimaging, meaning neuroimaging is often misrepresented and misunderstood within policy and practice and there is an over-estimation of the reliability of neuroimaging studies, with neuroimages being described as akin to a photograph (which it is not; see Munro & Musholt, 2014 for a discussion).

There are significant challenges with the interpretation of neuroimages and neuroimaging techniques in general, which remain in a developmental stage (for a full discussion see Munro & Musholt, 2014). There are also methodological issues associated with neuroscientific studies relating to child maltreatment. These include the difficulty to "control for co-morbid psychiatric disorders, which make it difficult to disentangle which of the above effects are due

to maltreatment, the associated psychiatric conditions or a combination or interaction between both" (Hart & Rubia, 2012, p. 1); the inability to differentiate the impact of socio-economic variables or societal issues which also affect child development; small sample sizes; lack of longitudinal studies; and limited studies exploring the impact of interventions (Hart & Rubia, 2012; Munro & Musholt, 2014). There are large individual differences in experiences, which make the generalisation of any neuroscientific study difficult.

Yet scholars, such as Rose (2011), have advocated for the integration of neuroscience and the social sciences:

> I would argue that any genuine increase in knowledge of brain processes… can only enrich our understanding of ourselves. Nor can such increased knowledge replace or diminish the insights into what it is to be human that come from philosophy, the social sciences or the humanities— although these disciplines will need to take the findings of neuroscience into account, just as neuroscience will need to respect these other perspectives and understandings. Here, therefore, there should only be benefits, providing one can pick one's way through the 'over-hyping' of apparent neuroscientific claims. (Rose, 2011, p. 69)

However, some social work scholars, such as Wastell and White (2012), are sceptical about what neuroscience can offer to social work knowledge and theory. In their paper, Wastell and White (2012) argued that neuroscience could not currently add anything new to the social sciences' and humanities' understanding of human functioning. Other authors (Beddoe & Joy, 2017; Gibson, 2021; Munro & Musholt, 2014; Plafky, 2016) take a more nuanced approach, tending to agree with Rose's (2011) integration argument, on the premise critical analysis is utilised. An analysis of trends relating to the use of neuroscience in child policy in Aotearoa New Zealand, undertaken by Beddoe and Joy (2017), highlighted that a critical analysis of neuroscientific knowledge is required. Through examining policy and the extant literature, they identified that trends in the discourse around parenting and neuroscience present

information that is not backed by robust research findings. Inaccurate and uncritical presentations of neuroscientific findings are also found within the media, which influences social workers' knowledge (Beddoe & Joy, 2017). Beddoe and Joy (2017) suggested that social work could integrate neuroscience findings with those of the social sciences, playing the important role of appropriately contextualising neuroscientific findings. Plafky (2016) also argued for social work to critically integrate neuroscientific knowledge in order to inform interventions. Munro and Musholt (2014) suggested that "in the context of a better understanding of the effects of maltreatment on children, insights from neuroimaging are at their most valuable and useful when combined with insights from the social sciences" (Munro & Musholt, 2014, p. 19); in particular, neuroscience may play a greater role in building understanding about the mechanisms involved in alleviating the negative effects of adversity. The contextualisation of neuroscientific findings means social workers must be able to critically engage with and analyse the neuroscience literature (Beddoe & Joy, 2017; Gibson, 2021; MacVarish et al., 2015; Munro & Musholt, 2014; Plafky, 2016; Wastell & White, 2012).

Whilst the current critiques of the application of neuroscientific findings are valid, it is important to highlight that there is not necessarily a problem with neuroscience. The issue is the uncritical application of any form of knowledge in social work practice. Increasingly, critical reviews of commonly utilised theories within the social work field have identified significant issues with the knowledge base and application of theory, particularly within the child protection context (for example, attachment theory; see Plafky, 2016; White, Gibson, et al., 2019; Wilkins, 2021). The integration of neuroscientific knowledge within social work is heavily influenced by training, with social workers struggling to access research findings due to workload pressures (Plafky, 2016) or having limited access to research resources (Beddoe & Joy, 2017). Plafky (2016) found that social workers often had a limited understanding of neuroscience and focused more on the practical applications of scientific knowledge, often adopting knowledge uncritically. Plafky wrote: "All neuroscientific knowledge translated into practice is based on a 'pick-and-choose' approach and limited to specific aspects that are useful

for practice and understanding" (Plafky, 2016, p. 1513). For example, evidence from neuroscience and neuroimaging studies is increasingly being used to advocate for early intervention with infants and young children. This is often due to the fallacy that maltreatment in the first few years causes irreversible damage (Beddoe & Joy, 2017; Bruer, 1999; MacVarish et al., 2015; Wastell & White, 2012). These arguments rely on inaccurate research which argues that the early years are important due to the majority of brain growth occurring during this period and there being sensitive or critical periods of development in these first few years, ignoring evidence that suggests the brain is resilient and capable of change (this is discussed further in Chapter Four; Bruer, 1999; Munro & Musholt, 2014; Wastell & White, 2012). Therefore, critical integration of neuroscience theory and knowledge is needed within existing social work frameworks as this may result in much safer practice, as articulated well by Gibson (2021):

> Instead of an uncritical adaptation of neuroscientific 'knowledge-as-usual', social work could reorient its engagement with brain-based discourse to align with core values of meaningful relationships, embodied practices and justice-seeking strategies. To this point, the 'new' promised in social work's translation of neuroscience has not fundamentally shifted social work practice, but rather bolstered justifications for existing or even resurrected practices and areas of scholarship. (Gibson, 2021, p. 2676)

Gibson's perspective is supported by other authors who view the pragmatic integration of neuroscientific knowledge within practice as being helpful within child protection social work (Harlow, 2021; Mackenzie & Roberts, 2017). For example, Mackenzie and Roberts (2017) provided a unique perspective as both scholars and adoptive parents, arguing that the use of neuroscience within social work practice and caregiving can provide "significant and sometimes seriously helpful shifts in parents' and children's sense of agency" (Mackenzie & Roberts, 2017, p. 134). It is, however, important that neuroscientific knowledge is integrated carefully into the existing knowledge base of social work. A useful starting position articulated within the literature may involve integrating neuroscientific knowledge alongside an

ecological systems model (Atwool, 2019; Beddoe & Joy, 2017; Green & McDermott, 2010; Munro & Musholt, 2014). Munro and Musholt (2014) advocated for an ecological-neuroscience integration:

> The importance of the family and the wider social and physical environment (and the complex interplay between them) in both the causation and response to maltreatment points to the need for a framework that can capture the interactions between very different aspects of a child's experience. The neuroscientific contribution to our understanding can and has been fitted into this framework (see Cicchetti, 2013) with a key focus being on the multiple levels of analysis needed to understand the complex and dynamic process of child development. (Munro & Musholt, 2014, p. 24)

The integration of neuroscience within an ecological framework could result in a cohesive practice theory that provides the evidence base for working effectively with children and young people to address their experiences of childhood adversity (Munro & Musholt, 2014; Sidebotham, 2001). Integrating neuroscientific knowledge within an ecological systems framework may reduce some of the challenges social workers face in applying it critically within their practice.

In summary, the uncritical adoption of neuroscientific knowledge without considering ecological and structural factors is problematic as it does not align with the aims of the social work profession, such as social justice and exploring the impact of structural factors on individual well-being (Gibson, 2021). The profession needs to critically engage with and apply neuroscientific knowledge within its current evidence base. This has implications for the effective application of the neurodevelopmental lens as the approach draws on neuroscientific knowledge (Perry, 2009, 2020; Perry & Dobson, 2013). An ecological systems framework has been suggested as a useful framework for achieving a critical integration of neuroscientific knowledge in child protection social work practice and this is why the ecological-transactional

perspective was selected as the theoretical framework informing this research (see Chapter Two).

Chapter summary

This chapter set out some important background for the research. It began with a discussion of child protection social work practice and how practice theory is used to guide assessment, planning, and intervention. The discussion then turned to critically reviewing trauma-informed approaches. Trauma-informed approaches utilise standardised screening tools and referrals to evidence-based interventions, which have been found to be problematic as they do not necessarily result in improved outcomes. Instead, more holistic approaches are recommended, which include the incorporation of neuroscientific knowledge. The research and literature suggest that a critical evaluation of the use of neuroscience within child protection social work practice is required. Researchers and practitioners have recommended that neuroscientific knowledge be critically integrated with the extant social work knowledge within ecological approaches. This background is important as the neurodevelopmental lens seeks to address the impacts of trauma and adversity and is informed by neuroscientific knowledge. As such, the careful integration of neuroscientific knowledge within the neurodevelopmental lens is necessary to ensure it is appropriately contextualised. This adds further justification for an ecological-transactional perspective being utilised as the theoretical framework for this research (as discussed in Chapter Two). The next chapter will describe the neurodevelopmental lens, drawing on the literature and the key informant interviews. The ecological-transactional perspective provides a structure for this discussion.

Chapter Four: The neurodevelopmental lens

The previous chapter discussed trauma-informed approaches and the challenges of integrating neuroscience into social work practice. It was argued that neuroscientific knowledge should be integrated within an ecological perspective to ensure alignment with the profession of social work. The aim of this research is to explore how child protection social workers understand and address the impacts of childhood adversity using a neurodevelopmental lens. This chapter builds on the preceding chapter by exploring the neurodevelopmental lens whilst considering an ecological-transactional perspective to ensure the appropriate contextualisation of neuroscientific findings. The chapter presents a critical review of the extant neurodevelopmental lens literature and integrates the findings from the key informant interviews.

The chapter begins with a brief overview of the neurodevelopmental lens. The neurodevelopmental lens is a set of principles that inform the understanding of adversity and provide a framework through which interventions can be selected to bring about healing. The discussion then explores how the neurodevelopmental lens is increasingly being used to inform practice (through the NMT), including social work practice. The remainder of the discussion of the neurodevelopmental lens is structured around the research's theoretical framework (the ecological-transactional perspective) outlined in Chapter Two. Reviewing the literature through the ecological-transactional perspective ensures that the literature review is located within the profession of social work (as social workers address well-being whilst also challenging structures and systems). The principles of the neurodevelopmental lens are located within the most appropriate level of the ecological framework. Table 2 provides an overview of the structure of this chapter.

Table 2

The structure of the literature review

Level of the ecological system	Key topics
The neurodevelopmental lens	The neurodevelopmental lens in practice
The individual	Sequential development Experience shapes development The stress response system
The microsystem	Relationships can be protective
The mesosystem	Creating a therapeutic web
The exosystem	
The macrosystem	

There is limited Aotearoa New Zealand literature on how a neurodevelopmental lens is used within child protection social work practice. Key informant interviews were completed to extend the international and Aotearoa New Zealand literature to provide a greater depth of understanding of the Aotearoa New Zealand context (see Chapter Two, Methodology and Methods for further discussion of the approach taken). The findings from the key informants have been integrated into this chapter to give their voices equivalent weight to the extant literature.

Three key informants participated in the research. Two informants (Anna and John) held expertise in a neurodevelopmental approach. Mere held te ao Māori knowledge and, like Anna, had extensive social work experience working with young people in Aotearoa New Zealand. Table 3 provides the background and qualifications of the key informants.

Table 3

Key informant backgrounds

Name	Background	Qualifications
Mere	Experienced Māori social worker employed in an NGO.	Master of Social Work
Anna	Background in social work. Clinical practice leader in NGO. Train the Trainer certification in NMT.	Doctor of Social Work
John	Child psychiatrist. Developed an international model based on a neurodevelopmental lens.	PhD, MD

The neurodevelopmental lens

The neurodevelopmental lens[24] draws together concepts from the fields of developmental psychology, neuroscience, social science, and traumatology to understand and address the impacts of childhood adversity (Perry, 2009, 2020; Perry & Dobson, 2013). The lens is the culmination of the work of Dr Bruce Perry, through the Neurosequential Network (formerly the Child Trauma Academy) in Houston, Texas. Perry began to publish his early work on the approach in the 1990s and 2000s (Perry, 2001, 2002, 2006, 2008, 2009; Perry et al., 1995). The approach developed out of frustration with traditional medical/psychological models that were ineffective at working with children who presented with attachment and developmental challenges due to trauma and neglect (Perry, 2020; Perry & Dobson, 2013). The neurodevelopmental lens is meant to complement and enrich (not replace) other perspectives and theories.

[24] The neurodevelopmental lens was referred to in Perry's earlier writing as the neurodevelopmental perspective (Perry, 2001, 2008). The term neurodevelopmental lens is used in this research as this was the most recent term used (Perry, 2009).

The key informants explained that a neurodevelopmental lens is "*bringing in a developmentally informed approach to their [the practitioners'] work*" (John). The neurodevelopmental lens achieves this through the articulation of a series of principles (Perry, 2001, 2002, 2006, 2008, 2009). The neurodevelopmental lens principles have undergone various iterations within Perry's work. The literature themes, including the neurodevelopmental lens principles, are now briefly overviewed, with the literature review returning in later sections to discuss them in greater detail.

The principle of **sequential development** refers to the development of the brain starting with functions located lower in the brain (such as controlling heart rate and movement) and progressing to functions located in the higher regions of the brain (such as complex reasoning; Perry, 2001, 2002, 2006, 2008, 2009). There are several principles within the neurodevelopmental lens literature that relate to experiences. Within this thesis, the principles are grouped together under an overarching principle named **experience shapes development.** The principles relating to experiences consider how experiences influence an individual's development (Perry, 2001, 2002, 2006, 2008, 2009). Another principle identified by Perry (2006, 2009) was **relationships can be protective** against the impacts of adversity. Finally, there is a recurring theme of the role of **the stress response system** and how the stress response system informs individual responses to possible threats (Perry, 2001, 2002, 2006, 2008, 2009; Perry et al., 1995).

When considered together, the principles of the approach provide practitioners with a greater understanding of the impact of childhood adversity and an approach to intervention. The neurodevelopmental lens enables an understanding of how childhood experiences affect the brain's development and stress response system. Human development is a complex process influenced by numerous factors, which include interactions between an individual's genetics, their environment and experiences, and the timing of these experiences (Cariaga-Martínez et al., 2018; De Bellis, 2001; Perry, 2001, 2002, 2008). The principles inform understanding of

development and have been utilised to develop the NMT model (discussed further below) which supports practitioners (from a variety of professional backgrounds) to understand the impacts of adversity and to develop intervention plans. Perry (2020) asserts that a neurodevelopmental lens should not be the only lens that is used. Instead, the lens complements and enriches other theoretical perspectives on behaviour and development. The key informants considered it to be a lens through which practice is shaped, allowing social workers to understand and select appropriate interventions to address the impacts of childhood adversity.

However, the application of the neurodevelopmental lens was viewed as being a challenge at times by the key informants. For example, Anna described a challenge relating to how to implement recommendations arising from the neurodevelopmental lens and how they approached overcoming this within their practice:

> *One of the challenges is I suppose… what the heck are we going to do about that now?… I think we have had to find ways to make the recommendations work… So, what we needed to do is put that into a plan that's workable… So, for example, if they had animal-assisted therapy [recommended] and there's no chance for the child to do animal-assisted therapy but the foster parents have a dog, we've had 5 o'clock you go and walk the dog. So, it's about making it more practical, I suppose. (Anna)*

Perry's neurodevelopmental lens approach has grown in popularity and his writing has become popular in society; through Perry's increasing public presence (Perry, 2020). Given Perry's popularity and influence, his work has been increasingly utilised within practice. This was the case with the social worker participants who were all familiar with Perry's work (discussed in more detail in Chapter Five). Understanding how the neurodevelopmental lens informs social work practice is, therefore, an important area for research within Aotearoa New Zealand.

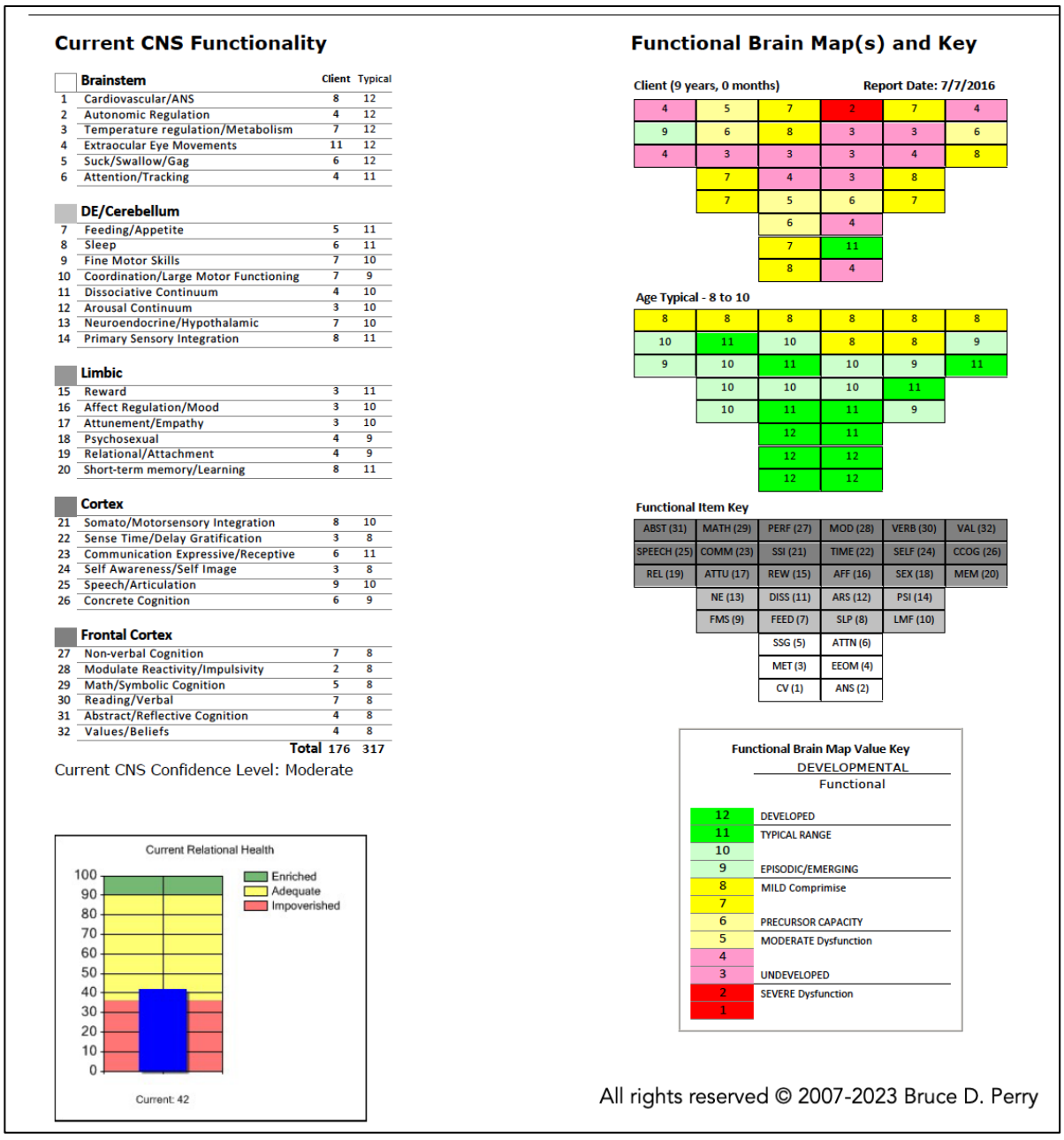
The neurodevelopmental lens and social work practice

The neurodevelopmental lens has been operationalised into a holistic model (the NMT) to assist practitioners (including social workers) in their understanding of childhood adversity and informs the selection of developmentally appropriate interventions. The NMT model will only be briefly outlined here, as good overviews of the model exist elsewhere (Perry, 2006, 2008, 2009, 2020; Perry & Dobson, 2013; Perry & Szalavitz, 2017). The model supports practitioners in gathering information and compiling existing assessment information to develop a plan for intervention. The NMT model comprises three phases (Perry, 2008, 2009; Perry & Dobson, 2013):

- **Gather developmental history**: The focus is on exploring adverse experiences and the quality of relationships throughout a child's lifetime, including whilst in utero. This provides an estimation of the timing and severity of developmental risk and protective mechanisms that may influence development.
- **Assess current functioning and relational health**: The level of current functioning is assessed across several domains and scaled to provide an estimate of how various areas of the brain may be functioning. The current quality and number of relationships are also scaled to represent the child's current level of relational health. The NMT model produces a "functional brain map" (see Figure 4), which visually depicts current functional challenges and strengths, and makes it easier for professionals to understand why certain interventions will be prioritised over others.
- **Develop recommendations for developmentally informed interventions**: The initial focus is on strengthening the relationships around the child (including removing stressors for parents/caregivers) as a core principle of the approach is the importance of relationships. Next, developmentally appropriate interventions are selected. These interventions use the bottom-up approach – targeting lower regions of the brain before higher ones.

Figure 4

The NMT functional brain map



Current CNS Functionality

	Brainstem	Client	Typical
1	Cardiovascular/ANS	8	12
2	Autonomic Regulation	4	12
3	Temperature regulation/Metabolism	7	12
4	Extraocular Eye Movements	11	12
5	Suck/Swallow/Gag	6	12
6	Attention/Tracking	4	11
	DE/Cerebellum		
7	Feeding/Appetite	5	11
8	Sleep	6	11
9	Fine Motor Skills	7	10
10	Coordination/Large Motor Functioning	7	9
11	Dissociative Continuum	4	10
12	Arousal Continuum	3	10
13	Neuroendocrine/Hypothalamic	7	10
14	Primary Sensory Integration	8	11
	Limbic		
15	Reward	3	11
16	Affect Regulation/Mood	3	10
17	Attunement/Empathy	3	10
18	Psychosexual	4	9
19	Relational/Attachment	4	9
20	Short-term memory/Learning	8	11
	Cortex		
21	Somato/Motorsensory Integration	8	10
22	Sense Time/Delay Gratification	3	8
23	Communication Expressive/Receptive	6	11
24	Self Awareness/Self Image	3	8
25	Speech/Articulation	9	10
26	Concrete Cognition	6	9
	Frontal Cortex		
27	Non-verbal Cognition	7	8
28	Modulate Reactivity/Impulsivity	2	8
29	Math/Symbolic Cognition	5	8
30	Reading/Verbal	7	8
31	Abstract/Reflective Cognition	4	8
32	Values/Beliefs	4	8
		Total 176	317

Current CNS Confidence Level: Moderate

Functional Brain Map(s) and Key

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Note: Used with permission from the Neurosequential Network.

Several studies have explored the efficacy and impact of the NMT approach in a variety of settings, such as inpatient psychiatric settings (de Nooyer & Lingard, 2016), early childhood (Barfield et al., 2012), outpatient mental health services (Zarnegar et al., 2016), adoption services (White et al., 2023), therapeutic services (Cox et al., 2021; Frederico et al., 2019;

Jackson et al., 2009), and residential foster care (Hambrick, Brawner, Perry, et al., 2018b). Several of these studies are now briefly outlined.

Cox et al. (2021) evaluated an intervention programme (Take Two) based on NMT. Using three measures (SDQ, Health of the Nation Outcomes Scale for Children and Adolescents, and the NMT metric), they found the implementation of the NMT programme resulted in significant improvements in measures of relational health, family and peer relationships, current functioning, disruptive behaviour, and emotional problems. Other evaluations of the same programme have identified similar findings, including significant reductions in anxiety, self-regulation, depression, anger, and trauma symptoms (Cox et al., 2020; Jackson et al., 2009). Barfield et al. (2012) found similar improvements in their examination of the impact of implementing a plan using developmentally appropriate activities for 28 children who had emotional and behavioural regulation problems. They found that children made improvements in their social and emotional development and externalising behaviours (as rated by teachers) within a six- to ten-week summer programme. Similarly, the use of interventions informed by neurodevelopment for children with foetal alcohol spectrum disorders has been explored in a pilot study by Zarnegar et al. (2016). Ten children under the age of five and their caregivers participated in the study and received interventions informed by neurodevelopmental principles for a period of at least six months. Using a variety of pre- and post-intervention measures, Zarnegar and colleagues found there were significant improvements in several developmental domains, including adaptive, motor, communication, cognitive skills, and self-regulation.

The studies identified in the previous paragraph are limited by their small sample size and lack of a control group. It is almost impossible to differentiate whether improvements are the result of the neurodevelopmental lens or the specific interventions that are recommended by the lens and used with the child. It may, therefore, be possible that the lens is not resulting in improvements, but instead, it could be the selected interventions making a difference. Whilst

this is a possibility, it is posited it is more likely the neurodevelopmental lens will lead to the selection of the most appropriate and effective interventions. Finally, limited research with long-term follow-up has been completed. This makes it difficult to ascertain if there are sustained improvements in functioning because of the neurodevelopmental lens. However, collectively, these studies suggest the use of the neurodevelopmental lens and NMT can result in improved outcomes for children and young people, especially when there is adherence to the recommended interventions (Evans et al., 2023).

The neurodevelopmental lens may be considered a practice theory (as defined in the previous chapter) as it provides an organising framework for knowledge that leads to the description and explanation of actions to take (Harms & Connolly, 2019; Harms & Maidment, 2017; Payne, 2020). Key informants Anna and John positioned the lens as a framework that supported their practice. For example, key informant Anna stated: *"It just is a lens that I see everything through now, on all different levels"* (Anna). This has influenced her approach to clients, resulting in a more intentional approach to planning:

> *In the past, we would have a plan, and we'd have a goal, and we would kind of identify different things that we think are necessary to work on and try and do our best and get a lot of things involved. Whereas now, we're very intentional. We look at each child, each child's needs, and we intentionally focus on different areas in terms of the recommendations that are made. (Anna)*

John agreed that a neurodevelopmental lens created a change in practice, resulting in improved outcomes for clients:

> *If people simply learn a couple of these core concepts and they have a growth mindset… and if they're willing to think about the implications of these sorts of concepts for their practice, they end up making really meaningful changes that have measurable outcomes. (John)*

John and Anna's perspectives suggest that the neurodevelopmental lens supports changes in practice. The shift is also being documented within the literature. For example, Hambrick, Brawner, Perry, et al. (2018a) analysed data from ten organisations providing residential care across three countries (Scotland, Canada, and the United States) for 2,744 clients. Analysis revealed a significant reduction in the use of restraints and critical incidents following the implementation of the NMT model for a period of 75 months. This suggests that the implementation of the model shifted practice, resulting in more appropriate responses to de-escalate children, along with proactively working to regulate the child. Overall, there was a significant reduction in escalations of behaviour. A shift in practice was also identified by Caplis (2014) who undertook semi-structured interviews with seven professionals (from a variety of professional disciplines) utilising the NMT model in the United States in order to explore how professionals viewed the NMT model. The interviews indicated that the participants found the neurodevelopmental lens useful, and it shifted their practice to ensure the interventions chosen were appropriate for the child's developmental level and a focus was on activities that helped to regulate the child. The study also found the neurodevelopmental lens, through the NMT model, emphasised strengthening a child's relationships.

There is currently limited literature exploring how social workers utilise the neurodevelopmental lens within their practice. Within a United States study (the only one identified as part of the literature search), Master of Social Work students were trained in the principles of the NMT model and how they related to social work practice (Mason et al., 2020). Focus groups were undertaken with 17 students and alumni. Similarly to Caplis, Mason et al. (2020) found that social work students "described the NMT as a conceptual framework that changed the way they thought about clients and how they interpreted their behaviour" (Mason et al., 2020, p. 359). The respondents in their study described a shift in how they viewed challenging behaviours and a framework from which to select various interventions, including non-traditional interventions, such as somatosensory interventions, music, or animal-assisted therapy. The participants' focus was on supporting clients to become regulated. Whilst Mason

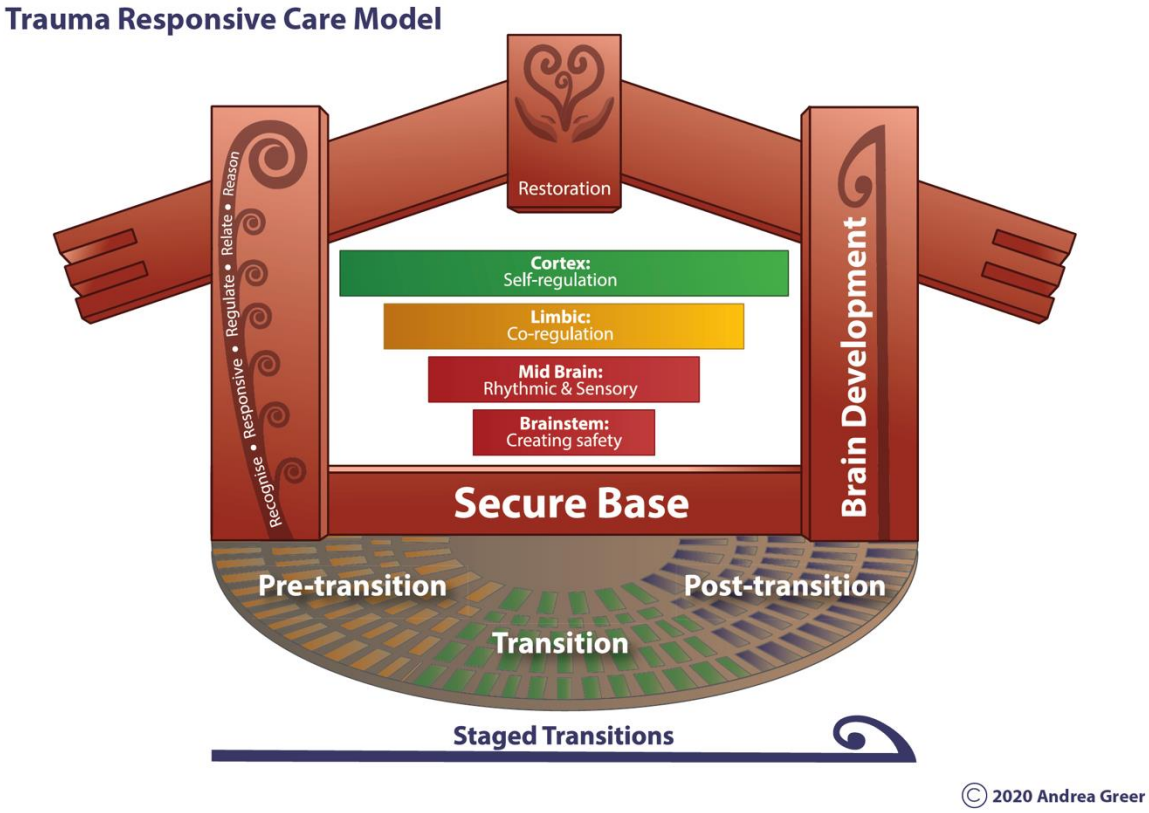
et al.'s (2020) study provides valuable insight into how social work students applied the neurodevelopmental lens, the findings of the study are largely focused on the individual and microsystem levels of an ecological framework. The study does not explain how the social workers considered or addressed societal structures located within the macrosystem, a key principle of social work (IFSW & IASSW, 2014).

Within the Aotearoa New Zealand context, there is limited research into the use of a neurodevelopmental lens within social work practice. The key informant narratives within this chapter support a greater understanding of the use of the neurodevelopmental lens within the Aotearoa New Zealand social work context. In evaluating the evidence-base for care and protection residential care best practice, Lambie (2016) identified NMT as a possible suitable model to guide interventions in care and protection residences in Aotearoa New Zealand, as it "provides a useful insight into the effects of trauma, and principles to guide practice" (Lambie, 2016, p. 70).[25] Drawing on their Master's research, Greer (2015, 2021) developed a trauma responsive care model based on the neurodevelopmental lens for use within residential group homes. Greer's model (depicted pictorially in Figure 5) draws on attachment theory and principles of neuroscience to provide an intervention framework for use within a residential care setting. The trauma responsive care model has not yet been evaluated.

[25] In Lambie's report, it was noted that NMT was implemented in one care and protection residence (Puketai) in Aotearoa New Zealand. An Official Information Act (1982) request to Oranga Tamariki revealed two team leaders of clinical practice have been trained in NMT, however, no evaluation of the effectiveness of NMT was completed by the organisation.

Figure 5

Trauma responsive care model



Note: Used with permission from Greer (2021).

The apparent limited implementation of the neurodevelopmental lens may be explained by challenges identified by Caplis (2014) and Mason et al. (2020). The challenges included a lack of familiarity with the approach by other professionals, meaning social workers had to educate their colleagues, which was, at times, met with resistance. The approach also often advocates for the selection of alternative interventions, which often are repeated several times throughout the day. This presents resourcing challenges and desired interventions not being readily available. Both Caplis (2014) and Mason et al. (2020) commented on the disparity between what social workers believed the child needed and the resources they were able to access to meet the needs of the child. These challenges suggest practitioners working with children and families may not widely understand the neurodevelopmental lens. Additionally,

the recommended interventions suggested by the lens may be difficult to implement and require creative solutions to implement recommended activities (as discussed previously by Anna).

The discussion will now turn to interrogating the literature and key informant interviews within an ecological framework (see Table 2 on page 63), highlighting the key themes and principles of the neurodevelopmental lens.

The individual level

The individual level section of the literature review discusses the neurodevelopmental lens principles of sequential development and experience shapes development. A recurring theme in the literature and key informant interviews relating to the stress response system is also explored.

Sequential development

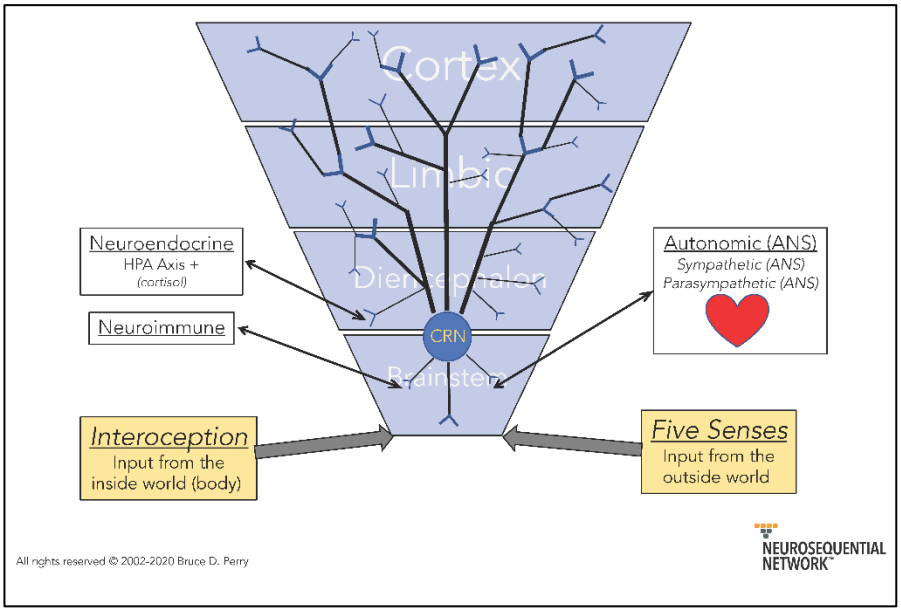
Perry (2009) explained that the brain is organised into distinct anatomical regions (brainstem, diencephalon, limbic system, and cortex), with each region being largely responsible for various functions. A useful heuristic to visually present the organisation and development of the brain is presented in Figure 6.[26] Whilst numerous areas of the brain are involved in each function, those identified in the heuristic are typically believed to have significant involvement in the process. The brain is organised and develops in a hierarchical manner (Perry, 2002, 2006, 2009). Simpler functions required for survival (such as those that control heart rate and breathing and are located in the lower, base brain) develop first whilst still in utero, as without them a baby would not survive (Farmer, 2009; Perry, 2002, 2009; Tau & Peterson, 2010).

[26] The image illustrates that incoming sensory information is processed in a bottom-up manner. The brain's core regulatory network (CRN) is a collection of important, widely distributed neurotransmitter networks. For a further discussion see Perry (2002, 2006, 2009).

Following this, the brain develops upward, with functions such as motor control developing, followed by increasingly complex functions, such as the attachment and emotional regulation systems located in the limbic region of the brain. Finally, the most complex functions, such as abstract thinking, typically controlled by the prefrontal cortex develop last (Farmer, 2009; Perry, 2001, 2002, 2009). Disruptions in the development of the lower regions of the brain are likely to impact on the development and functioning of higher regions of the brain due to the interconnected neural networks throughout the brain (Perry, 2001). Whilst the brain doesn't physically develop from the bottom up, it does develop from the bottom up when considered from a functional perspective. This means that functions originating low in the brain develop before higher functions. This is an overly simplistic discussion of how the brain develops – a fuller discussion is outside the scope of this thesis.[27]

Figure 6

The NMT heuristic for the brain



Note: Used with permission from the Neurosequential Network.

[27] Physiological development is extremely complex with numerous neurodevelopmental processes occurring, including the genesis of neurons, creating synaptic connections, and pruning of neurons and synaptic connections. See Kleim and Jones (2008), Perry (2001, 2002), Perry et al. (1995) for a discussion.

Whilst neurodevelopment has been simplified here, insight into understanding the impact of childhood adversity can be gained. This is important as sequential development provides an explanation for variations of responses to traumatic experiences – the same traumatic experience will affect different aged children differently due to the changing nature of brain development (Perry, 2008, 2009). Protective or adverse experiences are believed within the neurodevelopmental lens to affect the part(s) of the brain that are undergoing rapid development (Anda et al., 2006; Perry, 2001, 2002, 2008), although this is difficult to prove due to methodological limitations (for example, it is difficult to attribute differences in brain development to adversity with neuroimaging studies). The hierarchical organisation of the brain also provides insight into the selection of interventions, which is discussed in the next section.

Sequential selection of interventions

The sequential development of the brain provides a framework through which interventions can be selected (Perry, 2008, 2009, 2020). Within the neurodevelopmental lens, interventions are the intentional inclusion of developmentally appropriate activities into the day-to-day life of a child and are not limited to (but may include) more traditional forms of therapeutic intervention, such as TF-CBT (Perry, 2008, 2009, 2020). Belsky and de Haan (2011) provided a useful summary of possible interventions: "Many sources of influence can be envisaged, ranging from everyday social experience, especially if repeatedly encountered, to planned interventions, such as psychotherapy or occupational training" (Belsky & de Haan, 2011, p. 413).

Interventions should occur in a sequential, bottom-up manner, which reflects the order of normal development (Greer, 2021; Perry, 2008, 2009, 2020). Interventions should be age-appropriate and reflect the child's current level of functioning. This means that they target the lowest parts of the brain first. Perry (2020) explained the importance of the sequential selection of interventions:

> Cortical organisation and functioning depend upon previous healthy organisation and functioning of lower neural networks originating in the brainstem and diencephalon. Therefore, a dysregulated individual (child, youth or adult) will have a difficult time benefiting from educational, caregiving and therapeutic efforts targeted at, or requiring, 'higher' cortical networks. This sequential approach is respectful of the normal developmental sequence of both brain development and functional development. Healthy development depends upon a sequential mastery of functions; a dysregulated individual will be inefficient in mastering any task that requires relational abilities (cortico-limbic) and will have a difficult time engaging in more verbal/insight-oriented (cortical) therapeutic and educational efforts. (Perry, 2020, p. 144)

In this extract, Perry (2020) described how development occurs sequentially and the higher regions of the brain are reliant on the development of lower functions. This understanding is important to the neurodevelopmental lens as it provides a framework through which a child's challenges can be understood. For example, as Perry noted, a child who struggles with self-regulation may struggle to engage in cortical therapeutic and educational efforts. The understanding is also important to the neurodevelopmental lens as it guides the sequential selection of interventions.

According to the neurodevelopmental lens principle of sequential development, interventions should be selected in a sequential manner, with different regions of the brain responding to different interventions (Greer, 2021; Perry, 2008, 2009, 2020). Greer (2021) explained that various regions of the brain should be targeted with different interventions. For example, the brainstem requires a sense of safety; the diencephalon – rhythmic and sensory activities; the limbic system requires co-regulation and relational activities, while the cortex may benefit from interventions such as talking therapy. The discussion will return to these interventions in later sections of this chapter. Anna described a practical approach of how to use

developmentally appropriate interventions and sensory input to meet the child's needs in the lower regions of the brain:

> *So, if it's clear that this child, which [is the case] for most of our children, that they've been developmentally delayed actually by what they've experienced, we adjust some of those activities down. We would make sure that they have that input. So, for example, if it's a 5-year-old, we'd create a safe environment in the bedroom, we'd put a mosquito net over the bed, we'd put fairy lights in, and we'd put this and this and this… So, now, if you've got a 15-year-old that's still functioning on a 10- or 8-year-old level, that still needs the input, we would probably still be trying to create a cocoon effect in the bed, we may use lycra sheets, we'd have a lava lamp. (Anna)*

The child's development is enhanced by regularly reviewing and adjusting plans to ensure that they are meeting the child's developmental stage (Perry, 2009). A useful heuristic, attributed to Perry (Greer, 2015, 2021), for the sequential selection of interventions, using a bottom-up approach is: regulate, relate, and then reason. Anna and John explained the heuristic:

> *So, it's the regulate, relate, and reason… We're working on if we can get a child regulated, then we can work on being in relationship, and then we can work on talking about the thinking stuff. (Anna)*

> *It will regulate them a little bit and you'll be in a better position to kind of engage them and maybe even, you know, get to their cortex a little bit. (John)*

This means that the initial primary focus of any engagement with a child should be supporting them to become *regulated*. When a child is dysregulated, they may perceive people as a source of threat and be unable to reason (for example, trying to tell someone who is very upset to calm down is unlikely to be effective; Greer, 2021). This is discussed further in the stress response system principle. Once the child is calm, *relate* involves building a connection with the child. Interventions supporting relationships should follow interventions targeting self-regulation,

and this is discussed in the principle that relationships can be protective. *Reasoning* is the final stage, as individuals are likely to struggle to engage in a meaningful conversation if they are dysregulated or if there is no relationship (Perry, 2008, 2009). Interventions such as talking therapies (which draw on more verbal and insight-oriented cortical functions) are generally recommended after work has been undertaken to support and develop the child's self-regulation and relational skills (Perry, 2008, 2009). Self-regulation and relational skills are essential to support the work in talking therapies.

The next section relates closely to sequential development and intervention and discusses the impact of experiences on development.

Experience shapes development

There are several principles in the neurodevelopmental lens literature relating to the impact of experiences on development. On closer inspection of the principles, they appear to overlap. The principles are:

- Disproportionate valence of early childhood experiences due to windows of vulnerability (Perry, 2001, 2002, 2006, 2008, 2009);
- Activity-dependent organisation and use-dependent modification (Perry, 2001, 2002, 2006, 2008, 2009; Perry et al., 1995);
- Nature and nurture (Perry, 2001, 2002, 2008); and
- Neural systems can be changed (Perry, 2006).

As such, these principles relating to experience have been grouped together in this literature review under the overarching principle of experience shapes development, which is now discussed.

The brain is continuously modified by experience in childhood into adult life (Perry, 2001, 2006, 2009; Twardosz & Lutzker, 2010). Mere spoke from a te ao Māori perspective about the ability to influence and mould children for different roles to further the collective good, which included providing them with the necessary experiences:

> *In te ao Māori, children are seen as little gods – little atua (god) – and they can be seen to do no wrong. But we also see our children as our future. And so right from birth, they're being watched, and they're being modelled, and they're being trained… You know, traditionally, they were being trained for the different roles in the village. (Mere)*

Mere, like the other key informants, highlighted that children are shaped and influenced by their experiences and environment, which has an impact on their development in the long term. The key informants' views align with the extant literature, which suggests that experiences influence the developing brain and, therefore, functioning, including behaviour, emotions, and thinking (Belsky & de Haan, 2011; Perry, 2001, 2006, 2009; Twardosz & Lutzker, 2010). Belsky and de Haan (2011) elaborated on the influence of experiences on brain development:

> Unless one believes in magic, it is difficult to conclude… that parenting does not affect the developing brain, in terms of either structure or function – or both. After all, how else would parenting or any experience for that matter influence a developing organism's behaviour, cognitions, emotions and even, in some instances, physiology and health? (Belsky & de Haan, 2011, p. 409)

It is well-accepted within the extant literature that adverse experiences in childhood increase the likelihood of poor outcomes later in life (Cook et al., 2005; Felitti et al., 1998; Hughes et al., 2017; Spratt et al., 2019). There has been a significant amount of research and focus on the impact of adverse experiences since Felitti et al.'s (1998) first ACEs study. Hughes et al. (2017) undertook a systematic review and meta-analysis of the association between ACEs and health

outcomes. Their review found moderate associations between increased numbers of adverse experiences and poor health outcomes, including smoking, problematic alcohol and drug use, cancer, heart disease, respiratory disease, sexual risk-taking, mental ill health, interpersonal violence, and suicide attempts. The theory of latent vulnerability has been used to explain the link between child maltreatment and differential outcomes in relation to psychiatric risk (Gerin et al., 2019; McCrory et al., 2017; McCrory & Viding, 2015). It proposes that the broad variety of outcomes following childhood adversity can be explained through these experiences altering numerous behavioural and neurobiological systems (such as threat processing, reward, emotional regulation, and executive control) that are adaptive at the time, within the context but over time prove to be maladaptive (Gerin et al., 2019; McCrory et al., 2017; McCrory & Viding, 2015). The theory posits that cumulative experience and other environmental and genetic factors contribute as protective or risk factors, resulting in the variety of outcomes seen following childhood adversity. Featherstone et al. (2018) argued that these changes are adaptations following adverse experiences. This is consistent with the neurodevelopmental lens' view that experiences, both protective and adverse, can result in changes to the brain that impact functioning as an adaptive protective mechanism (Perry, 2006, 2009). Adverse experiences can result in "disruptions of neurodevelopment that will result in neural organisation that can lead to compromised functioning throughout life" (Perry, 2002, p. 87). Given the broad range of cumulative factors that impact outcomes, it is impossible to predict how a child will be affected by childhood adversity. However, it is sufficient to say that experiences of childhood adversity have an impact on development. Understanding the impact of experiences on development can support social workers (and others working with the child) to have more empathetic responses to children's behaviours (Caplis, 2014; Mackenzie & Roberts, 2017; Mason et al., 2020).

Experiences and brain development processes

The neurodevelopmental lens proposes that the repetitive activation of the brain's systems influences the brain's organisation and future functioning (Kleim & Jones, 2008; Perry, 2001,

2006, 2009; Twardosz & Lutzker, 2010), referred to as "use-dependent-modification" by Perry (2009, p. 243). Use-dependent-modification says the brain is organised around activity, or systems, frequently activated by experiences (Perry, 2001, 2006, 2009; Twardosz & Lutzker, 2010). Yet, processes driven by neurobiological processes also influence development (Belsky & de Haan, 2011; Perry, 2001, 2002; Perry et al., 1995). In their review of the evidence of the links between parenting and children's brain development, Belsky and de Haan (2011) described, in greater detail, three processes influencing brain development:

- **Gene-driven processes** are not influenced by experiences and "protect the developing brain, guide neuron migration, and target many of their synaptic connections, while also determining differentiated functions" (Belsky & de Haan, 2011, p. 413).
- **Experience-expectant processes** are when the brain expects to receive certain experiences common to the human species.
- **Experience-dependent processes** relate to the influence on development from the individual's unique experiences. This process, which can occur at any point in a person's life, is believed to involve the formation of new or modification of existing synapses.

These processes are believed to occur mainly sequentially, with gene-driven processes occurring primarily during gestation, followed by experience-expectant processes, and then experience-dependent processes, which can occur throughout the lifetime (Belsky & de Haan, 2011). Experience-expectant processes (also known as sensitive or critical periods of development) have been critiqued within the literature. Sensitive or critical development periods are explained as when certain experiences are expected within a certain timeframe for healthy development to occur (Perry, 2001, 2002, 2009; Perry et al., 1995). However, sensitive or critical periods of development are highly contentious as there are only two known critical periods: language acquisition and aspects of visual development (Beddoe & Joy, 2017; Bruer, 1999). For example, in language acquisition, children exposed to a greater quantity, quality,

and diversity of speech learn to speak faster and have a greater vocabulary, even when controlling for factors such as socioeconomic position (Jones & Rowland, 2017; Rowe, 2012). Neglect has been associated with challenges in language development (De Bellis et al., 2009; Jones & Rowland, 2017; Parish et al., 1985). Beddoe and Joy (2017) summarised Bruer's argument:

> He contends that critical periods are atypical for human development, and must be rare. This must be so given the diversity of environments that children are born into as it would be evolutionary unwise for critical periods, which rely on certain expected environmental stimuli, to be so prevalent in our environment. (Beddoe & Joy, 2017, p. 69)

This has led to critics challenging approaches such as the neurodevelopmental lens due to a misinterpretation of neuroscientific studies and knowledge, resulting in an overstatement of the number of critical and sensitive periods than there appear to be (Beddoe & Joy, 2017; Bruer, 1999; MacVarish et al., 2015; Munro & Musholt, 2014; Wastell & White, 2012).[28] Arguments for critical and sensitive periods have drawn on animal studies or studies of children where there has been extreme global deprivation (for example, in orphanages). As Bruer (1999) suggested, this is unlikely to be the experience for most children, and they are likely to have some level of expected input. Furthermore, the complexity of development, given that it is the cumulation of all experiences and every individual has an entirely unique set of experiences, makes it almost impossible to determine the impact of specific actions on development. However, Perry (2002) appeared to take a more cautious approach:

> What evidence there is would suggest that humans tend to have longer periods of sensitivity and that the concept of critical periods may not be useful in humans. It is plausible, however, that abnormal microenvironmental cues and atypical patterns of neural activity during sensitive periods in humans could result in malorganisation and

[28] For a fuller discussion see Bruer (1999), Munro and Musholt (2014), and Wastell and White (2012).

> compromised function in a host of brain-mediated functions. Indeed, altered emotional, behavioural, cognitive, social and physical functioning has been demonstrated in humans following specific types of neglect. (Perry, 2002, p. 90)

It is important that social workers are aware of how experiences shape development and some of the myths and controversies outlined above. Whilst critical periods may be controversial, Perry's (2002) point is that our experiences shape our development, however, this appears to be on a graduated scale. The development of lower regions of the brain in utero and in the first few years of life appears to be largely influenced by our genetics and, to a lesser extent, by experiences (Perry, 2002, 2009; Siegel, 2006). Environmental influences, such as alcohol or maternal stress, may have an impact on the developing brain in utero (Perry, 2001; Ungar & Perry, 2012). As the child gets older, the balance begins to shift with experiences having more influence over development than genetics. For example, higher regions of the brain, which develop through adolescence, such as the limbic and cortex, appear to be more influenced by experiences (Perry, 2002, 2009; Siegel, 2006; Ungar & Perry, 2012). Perry (2009) explained children are more likely to be affected by adverse experiences as their brain is rapidly organising and they are, therefore, more susceptible to the influence of experience than an adult:

> While experience may alter the behaviour of an adult, experience literally provides the organising framework for an infant and child. Because the brain is most plastic (receptive to environmental input) in early childhood, the child is most vulnerable to variance of experience during this time. (Perry, 2009, p. 245)

The key informants provided insights into how social workers in Aotearoa New Zealand can draw on the principle that experience shapes development. The understanding of past experiences was viewed by Anna and John as supporting a shift in thinking about a child's behaviour. Anna gave an example of this from her experience in working with foster parents

who may be quick to blame children as being naughty, rather than understanding the underlying causes of this behaviour:

> *I think that they'd always just seen behaviours, or, and I don't want to generalise… many of our foster parents have just kind of seen these behaviours and I think typical parenting says that those behaviours are because of children that are naughty and that just don't want to listen, and you know are oppositional… And for them, I kind of think it was, ahhhh, that's why they're doing it. Actually, their brain is wired in a way for them to respond in a certain way, and actually, that's because they've been in survival mode all of their lives. (Anna)*

The understanding of the child's history, and therefore why they may be responding in the manner they are, was described by Anna as helpful as it can result in a shift in thinking and a more empathetic approach to the child. John expanded on this notion, understanding the history of the child and their family is important as it provides a foundation from which intervention planning can occur:

> *Because knowing the story of the family and the story of a child and their history of good things and bad things, I think is really important to inform future either treaters or members of the child welfare system that are going to work with these families. (John)*

John highlighted the importance of understanding history as shaping the approach to working with children and families. The next section discusses how experiences inform interventions and enable hope for change.

Experiences provide hope for change

The ability of the brain to change (referred to as brain plasticity) through experiences is important to the neurodevelopmental lens and provides the foundation for interventions (Perry, 2006). The plasticity of the brain reinforces two important points: firstly, our

experiences affect our development (discussed above), and secondly, experiences can change the brain, bringing about healing. Key informant Anna expanded on how the principle helps understanding of past experiences but also provides hope for change:

> *Experience shapes the brain and gives us a bit of an answer to what happened in the past, but it also gives us hope for the future because we have a sense of, you know, actually new experiences can also shape the brain and there's some plasticity there. (Anna)*

The principle provides hope for the future as the brain is considered to be plastic that is changeable through repeated activation of neural systems (Farmer, 2009; Perry, 2006, 2008, 2009). Perry (2008) strongly emphasised this principle: "The therapeutic implications of this second neurodevelopmental principle cannot be overstated. Repetition, repetition, repetition: Neural systems – and children – change with repetition" (Perry, 2008, p. 37). Perry (2009) elaborated: "Any efforts to change the brain or systems in the brain must provide experiences that can create patterned, repetitive activation in the neural systems that mediate the function/dysfunction that is the target of therapy" (Perry, 2009, p. 244). To address the impact of adversity and to achieve positive development, sufficient repetition of targeted interventions is required. There is no formula for the number of repetitions or how often interventions should be repeated; however, once a week (such as the frequency of more traditional talking therapies) is unlikely to be sufficient and frequent repetitions throughout the day are viewed as being appropriate (Perry, 2006, 2008, 2009). Perry (2008) noted that it is much harder to change already organised systems (i.e., it is easier to change thoughts [cortex] than the stress response system [brainstem]), but through sufficient targeted, repetitive, patterned, rhythmic experiences change is possible in lower regions of the brain. The repetition of activities is returned to regularly throughout the chapter, as this is a primary component of the neurodevelopmental approach.

The next section builds on the understanding of the impact of experiences and discusses the stress response system.

The stress response system

Adversity has a significant impact on how individuals respond to stress and is a key mechanism through which an individual's responses are understood through the neurodevelopmental lens. The human stress response system has evolved to minimise harm when adverse circumstances present themselves. It is an adaptive mechanism designed to help individuals navigate through their day, respond to stressors, and survive (Porges, 2011; Ungar & Perry, 2012). The stress response system is highly responsive to novelty, transitions, stress, distress, and perceived threat cues, allowing the body to instinctively prepare for the impending danger to maximise chances of survival (Perry, 2001, 2009; Porges, 2011; Ungar & Perry, 2012). In a process termed *neuroception* by Porges (2011), all incoming information from the senses and internal feedback systems is assessed at the lower levels of the brain for threats (either real or perceived) before being passed onto higher regions of the brain. If the incoming information is assessed as being a threat, the brain responds to this extremely quickly through activating the stress response system (often before the individual is even conciously aware of the threat; Griffiths & Hunter, 2014; Perry, 2001, 2006; Porges, 2011; Wilson et al., 2011):

> *Because of the… core regulatory networks that we have that are low in the brain, that when we start to get stressed or distressed, we start to just shut down some of these important cortical capabilities that human beings have. So, we go from a rational creature to a more reactive person. (John)*

What John described here is the activation of the stress response system, where the assessment of information happens very quickly and subconsciously, with the body responding often before the individual can make sense of the threat (for example, someone jumping when they see what they think is a snake in the grass, before realising it is only a piece

of rope). There are a number of regions in the brain which are involved with the quick response to threats, collectively referred to as the stress response system.[29] In typically developing children, the response to threat is adaptive and is typically proportionate to the level of threat, occurring along two continuums: the hyperarousal and dissociative continuums (Perry et al., 1995; Porges, 2011; Ungar & Perry, 2012). Table 4 presents the possible responses to threats as a continuum based on the level of perceived risk. After the brain determines something is not a threat, the stress response system (typically) quickly returns to a state of homeostasis (Ungar & Perry, 2012). As John highlighted in the quote above, throughout both dissociative and hyperarousal responses, cortical capabilities (i.e. abstract or creative thinking) are reduced in order to allow increased focus on the threat (Wilson et al., 2011).

Table 4

The stress response continuum

	CALM	ALERT	ALARM	FEAR	TERROR
Hyperarousal continuum	Rest	Vigilance	Resistance	Defiance	Aggression
Dissociative continuum	Rest	Avoidance	Compliance	Dissociation	Fainting

Notes: When a threat is perceived, the brain and body will respond in a manner consistent with the level of threat. The greater the perceived threat, the greater the response, which includes alteration of mental state, cognition, and physiological. As the individual moves further along the continuum and becomes more afraid, they use increasing adaptive strategies to keep themselves safe drawing from the hyperarousal or dissociative continuums. Cognitive capacity is diminished the further along the continuum one moves. For example, an alarmed child is likely to struggle to concentrate and may appear to be daydreaming or avoiding doing work at school. (Adapted from Perry, 2006; Perry et al., 1995).

[29] It is outside the scope of this thesis to describe the neurochemical and physiological processes involved in the stress response system. See Griffiths and Hunter (2014), Perry et al. (1995), Ungar and Perry (2012), and Wilson et al. (2011) for a discussion.

The hyperarousal continuum is what is typically described as the fight or flight response. When a child perceives a threat, they can move along the hyperarousal continuum, showing hyperactivity, anxiety, difficulty regulating emotions, behavioural inhibition, sleep problems, and, at times, aggression (fight; Perry et al., 1995). The hyperarousal continuum is typically associated with externalising behaviours. The hyperarousal response is more often associated with males and older children, as they are often physically more capable of a fight or flight response (Perry et al., 1995). The stress response system prepares the body to respond by increasing the physiological responses favourable to fighting or fleeing (such as increasing heart rate and blood pressure, increasing muscle tone, and activating the immune system) whilst decreasing routine activities like digestion (Jiang et al., 2019; McEwen, 2006; Perry et al., 1995).

A fight or flight response is not the common strategy adopted by young children as they tend to seek proximity to their caregivers for protection and may also utilise a dissociative response. The dissociative continuum sees an individual try to protect themselves from harm through freezing which allows for more attention to be made to possible threats, allowing one to figure out how to respond (Perry et al., 1995). The continuum is named after the predominant approach of dissociation. Perry et al. (1995) defined dissociation as "simply disengaging from stimuli in the external world and attending to an 'internal' world. Daydreaming, fantasy, depersonalisation, derealisation, and fugue states are all examples of dissociation" (Perry et al., 1995, p. 280). The stress response system is also involved in dissociative responses to stress, although there is almost an opposite reaction to the hyperarousal continuum. When utilising a dissociative response, there is a reduction in blood pressure and heart rate (explaining why sometimes people faint when terrified; Perry et al., 1995). Dissociative responses appear to be utilised in situations where the individual is likely to experience physical injury, pain, or torture, and explain why there is a withdrawal into oneself. The hyperarousal and dissociative continuums are not mutually exclusive; individuals may draw on aspects of both during the same stress response (Perry et al., 1995).

Healthy relationships are thought to mediate adversity through the modulation of the activity and reactivity of the stress response system (Beeghly et al., 2016; Ludy-Dobson & Perry, 2010; Perry, 2001, 2009; Ungar, 2005). For children, this is often referred to as co-regulation (Beeghly et al., 2016). Perry (2009) explained:

> Individuals who have few positive relational interactions (e.g., a child without a healthy family/clan) during or after trauma have a much more difficult time decreasing the trauma-induced activation of the stress response systems and therefore will be much more likely to have ongoing symptoms (i.e., there will be more prolonged and intense activation of the stress response systems and, hence, a "use-dependent" alteration in these systems). (Perry, 2009, p. 246)

The literature and the key informants emphasised that an individual's stress response system is adaptive to experiences in a use-dependent manner. Typically, the stress response system is adaptive and beneficial when it is activated rapidly and then terminated quickly (for children often with the support of a caregiver; McEwen & Gianaros, 2011; Perry, 2001, 2009). Throughout childhood, when a child is hurt, upset, afraid, or dysregulated (possibly due to having unmet needs such as being hungry) the adults around the child will typically reassure them and meet the need. Through many repetitions of consistent, predictable, nurturing, and responsive care the child develops a flexible and responsive capability for self-regulation and learns to rely on familiar adults and is able to be soothed and comforted by them (Beeghly et al., 2016; Perry, 2009; Ungar & Perry, 2012). If the child's stress response system is activated, through nurturing care and support, they quickly return to a state of homeostasis (or calm) with the caregiver acting as an external stress-regulator (co-regulation; Beeghly et al., 2016; Ungar & Perry, 2012). If a child does not have their needs met or the adults around them are a source of threat, the child may develop an internal working model that the world is not safe and adults cannot be relied on (Beeghly et al., 2016). Current relational interactions are influenced by the template of the child's early caregiving experiences (this is akin to attachment theory and is discussed further in the next principle relating to relationships;

Beeghly et al., 2016; Perry, 2009). It is for these reasons that the neurodevelopmental lens focuses on regulation before relationships. Regulation can be supported through somatosensory methods (discussed further below), whereas a dysregulated child may feel threatened by approaches to provide support and care, resulting in further dysregulation.

Activation of the stress response system, when it is predictable and moderate or when there is sufficient relational support to mediate the stress response, leads to an increased capacity to respond to stress in a more functional and flexible manner (Beeghly et al., 2016; Ungar & Perry, 2012). However, repeated or prolonged activations of the stress response system, or lack of relational support, can result in long-term changes to the stress response system and other associated systems such as the nervous, endocrine, and immune systems (Beeghly et al., 2016; McEwen, 2006; McEwen & Gianaros, 2011; Misiak et al., 2022; Perry, 2001; Perry et al., 1995; Ungar & Perry, 2012).[30] For some children this can result in increased reactivity of the stress response system, where the limbic system assesses non-threatening stimuli as threatening or overestimates the level of perceived threat, resulting in an unnecessary or over-activation of the stress response system, hyperarousal, and disinhibited behavioural control (Hein & Monk, 2017; Hunter et al., 2011; McCrory & Viding, 2015; Perry et al., 1995; Ungar & Perry, 2012; Wilson et al., 2011). These changes mean children who have experienced adversity may be more likely to perceive neutral stimuli as threats or operate at a higher state on the arousal continuum (for example, they may always be in a state of alert) meaning they react faster to new perceived threats.

The key informants emphasised the importance of understanding how the stress response system works and that children who have experienced adversity may be more likely to have an activation of this system, even when there is no apparent reason for doing so. This supported a greater understanding of the child's current behaviour and functioning. For example, the

[30] These changes are sometimes referred to within the literature as allostatic load.

child's current state (such as calm, alert, afraid, fearful, or terrorised) is important to consider as it affects the child's ability to function:

> *If they're calm, they can think stuff through, and if they're in a state of fear or terror, they can't. So, we're always balancing it on that. And so, if they're not regulated today, what state are they in? (Anna)*

Anna highlighted that if a child is in a state of fear or terror, their stress response system is likely to be activated, which affects their ability to function in other areas (i.e., socially and cognitively) in that moment. As such, the key informants viewed supporting the child to regulate themselves as being a core priority and it affected the manner in which they responded to the child:

> *When they're in the midst of… what looks to be dysregulated behaviour, the key is to really figure something out right now that is going to help them get regulated. (John)*

The discussion will now turn to how the development of self-regulation is achieved.

Approaches to supporting the development of self-regulation

Patterned, repetitive, rhythmic activities which are somatosensory in nature help a child regulate (Fraser et al., 2017; Kilroy et al., 2019; Lane et al., 2019; Perry, 2008, 2009; Ryan et al., 2017). Somatosensory refers to sensory, or bottom-up processes that include the tactile (touch), vestibular (movement and balance), and proprioception (sense of position) systems. Bottom-up approaches to regulation utilise the senses through activities such as movement or touch, compared with top-down approaches which utilise the cortex to down-regulate (Beeghly et al., 2016; Fraser et al., 2017). John explained how somatosensory activities help with regulation:

> *The reason they work is that they, you know, all your sensory input from the outside world and interoceptive input from inside the body, all of it has its first stop up at the lower parts of the brain, very close to the core regulatory networks that control*

> *attention, arousal, and you know, everything else. And so, if you have those systems, if they're overactive, and you use patterned, repetitive, rhythmic activity that is basically tapping into a pre-existing memory that you created in utero and then have reinforced, most of us, by attentive, attuned, somatosensory interactions when we were babies. That makes us feel safer and it's regulating. (John)*

Sensory-based interventions are increasingly being used (by occupational therapists and social workers) to support the development of sensory integration and self-regulation (Fraser et al., 2017, 2019; McGreevy & Boland, 2020; Perry, 2008; Warner et al., 2020). Rhythmic, patterned, repetitive activities, such as rocking, drumming, music and massage, have been shown to reduce arousal levels, having a calming effect as John identified (Lane et al., 2019; Perry, 2008). As John alluded to, parents often use techniques to soothe newborn babies, such as gentle shushing, rocking, and swaddling, actions that are viewed as being similar to in-utero (Atkinson et al., 2015; Möller et al., 2019). Similarly, the natural rhythms and routines of life are believed to also support regulation, as explained by Badenoch (2018):

> Our current culture has moved far away from the rhythms of communal life. At that time, the group came together throughout the day around the sound of corn being ground, the slap of clothes on rocks as they were washed, the rhythm of butter being churned. Babies were rocked in time with the tribe's life, and children often organised their games in harmony with these daily activities as well. (Badenoch, 2018, p.111 as cited in Tucci et al., 2020, p. 156)

There are strong parallels between these early childhood experiences and somatosensory experiences that are believed to help with self-regulation. For example, the SMART (Sensory Motor Arousal Regulation Treatment) model, developed by psychologists and social workers, integrates somatic regulation, trauma processing, and attachment-building through the use of movement and sensation to support emotional and behavioural regulation (Warner et al., 2020). Bottom-up approaches to regulation may be more effective and developmentally

appropriate for children, compared to top-down approaches which utilise higher cortical functions, including language and executive control (Fraser et al., 2017; Perry, 2008; Warner et al., 2020). This is thought to be because the neural networks involved in the stress response system originate low in the brain (Perry, 2008). As has been previously discussed, the functional development of higher brain areas of children who have experienced adversity often are behind their peers and so interventions which require the predominant use of language or understanding of emotions may be less effective (Fraser et al., 2017; Perry, 2009). The use of somatosensory activities to support regulation is, therefore, a key feature of the neurodevelopmental lens.

Ideally, these somatosensory regulating activities should be repeated, or 'dosed', throughout the day (Perry, 2009). As has been previously discussed, development is shaped through experiences and as such, a key component of brain plasticity is repetition (Kleim & Jones, 2008; Perry, 2008). To change the brain, several repetitions must be implemented. With enough repetition, new ways of functioning can be formed. Anna gave an example, where through introducing these sorts of activities and repeating them with sufficient frequency, changes were made for a young girl:

> *So, if you think of time, it's literally like three and a half years later, I can see a little girl who was scratching herself and scratching all the scabs off her body and really, really picking at her face, and she's not doing that anymore. But that took three and a half years of not always getting it right 100% but really working intentionally at building enough scaffolding in for her. (Anna)*

The scaffolding that Anna referred to is the intentional building of patterned, repetitive, somatosensory activities throughout the child's day to help the child regulate, as the scratching was a form of dysregulation. Through repeated somatosensory activities, which support regulation, the child is supported to regularly return to a state of calm. Through enough repetition, the child may improve their ability to self-regulate.

The key informants stated that regulating activities can also be connected to a child's culture, with many practices of indigenous people drawing on rhythmic, regulating, and somatosensory activities:

> *People experience through their bodies. When you look at most of the indigenous populations, I mean they experience – they dance, they move, they sing, they drum. (Anna)*

> *The way we kind of help people through this stuff is through our own ways, our own healing methods. There's rongoā [traditional Māori medicine], there's mirimiri [massage], which is your massaging and, you know. But remembering that our understanding of, when a hara [a transgression, wrongdoing or violation of tapu (sacred, prohibited)] has occurred, which is a bad thing, there were karakia [prayer] for that… you know, just those traditional ways that things were done. (Mere)*

All the key informants stated that traditional cultural approaches can be drawn on as they are often rhythmic, repetitive, and somatosensory in nature which can result in the calming of the stress response system. An approach to traumatic brain injuries[31], Te Waka Oranga (Elder, 2013a, 2013b) draws on te ao Māori (Māori worldview) and mātauranga Māori (Māori knowledge). The approach seeks to strengthen whānau and whakapapa (genealogy, lineage, descent) connections and use traditional Māori healing "interventions, such as karakia, mirimiri, romiromi [massage], waiata [song], oriori [to chant, a lullaby], korero [sic; speech or discussion], whakarongo [to listen], awhi [embracing], tautoko [support, advocate], manaaki ki te whānau [caring for the family]" (translations added in square brackets; Elder, 2013b, p. 421). Several Aotearoa New Zealand studies have explored the use of cultural activities, such as those identified by Elder, that have a sensory component, such as kapa haka

[31] Learnings can be drawn from the field of traumatic brain injuries as there are similarities through trying to help develop greater self-regulation and restore well-being as a result of changes to the brain (the cause is simply different).

(a Māori rhythmic chant and dance; Hollands et al., 2015; Sweetman, 2017), flax weaving (Kirkwood, 2015), and waiata (Sweetman, 2017), in mental health settings for adults. These sorts of activities may help with regulation. Hollands et al. (2015) interviewed clients in a Māori mental health service about their experiences with kapa haka. They reported that they felt more grounded, safe, and connected with their cultural identity. Similarly, Kirkwood (2015) provided anecdotal evidence for flax weaving supporting sensory regulation and cultural connections within a relational environment. These activities are sensory and rhythmic in nature and would be recommended from a neurodevelopmental perspective and can be culturally appropriate, supporting connection with an individual's culture. Utilising somatosensory and rhythmic activities should ideally occur alongside a caregiver as this provides an opportunity for co-regulation to occur.

The next section discusses the literature and findings from the key informant interviews relating to the microsystem, which includes relationships and the importance of building a sense of belonging and connection.

The microsystem

The microsystem is the closest layer to the individual. The microsystem consists of the systems that an individual is connected to (for example, home or school). Within this level of the ecosystem, the literature and findings from the key informant interviews relating to the principle of relationships is discussed.

Relationships can be protective

Relationships are protective and can have the effect of buffering the impact of adverse experiences (Perry, 2002, 2009). There is a strong consensus within the neurodevelopmental lens and wider extant literature that positive and supportive relationships are protective (Bell & Romano, 2015; Duh-Leong et al., 2021; Perry, 2009; Sanders et al., 2017, 2018; Ungar,

2013a, 2013b; Ungar et al., 2013). The key informants identified relationships as significant to the neurodevelopmental lens as extremely important in supporting healing and well-being:

> *I think the greatest resilience factor is relationship. So, if there's a strong relationship it can carry you through. (Anna)*

The quality, number, and stability of interactions between a person and their environment (i.e., the quality of their relationships) has been found to promote resilience following childhood adversity and is important to the neurodevelopmental lens (Duh-Leong et al., 2021; Hambrick et al., 2018; McLaughlin et al., 2015; Perry, 2009; Ungar, 2013a, 2013b; Ungar et al., 2013). Research into resilience (typically defined as the process of positive adaptation following experiences of adversity) has consistently highlighted the importance of relationships for resilience (Bell & Romano, 2015; Sanders et al., 2017, 2018; Ungar, 2005, 2013a, 2013b; Ungar et al., 2013). Ungar (2013b) defined resilience as a social-ecological construct, or "the capacity of *both* individuals and their environments to interact in ways that optimise developmental processes" (italics his; Ungar, 2013b, p. 256). Whilst individual capacity is seen as important, changing the social ecology and environment is seen to be more effective at mitigating the effects of childhood adversity (Perry, 2009; Ungar, 2013b). Friedli (2009) identifies (for the World Health Organisation), the strong link between resilience and relationships:

> The significance of mental health and its role in our survival confirms the importance of humans as social beings: levels of social interaction are universal determinants of wellbeing across all cultures. But the unique nature of each person's mental character also reminds us of the power of the individual: *"no one survives without community and no community thrives without the individual"*. (Friedli, 2009, p. iv, emphasis in original)

As illustrated in this quote, there is a strong connection between relationships and well-being. Relationships appear to mitigate the impacts of and support healing from adversity. As such,

the neurodevelopmental literature identifies the importance of forming connections across multiple settings (Hambrick, Brawner, & Perry, 2018; Hambrick, Brawner, Perry, Brandt, et al., 2018; Perry, 2002). Hambrick et al. (2018) explored the impact of relational health (the number and quality of relationships a child has with attuned caregivers, family members, teachers, or their community) on current functioning. Increased levels of assessed current relational health were related to higher levels of functioning. Whilst causation cannot be drawn from these findings as it is plausible that children with improved functioning are better able to sustain relationships, the findings appear to be supported more broadly by the literature (Bell & Romano, 2015). This understanding of supporting positive relationships informed the key informants' approach:

> *Who is this kid going to have dinner with at [Christmas]? – find those people and bring them in. What's he good at? Find somebody who can mentor – like if he likes running, find some high school kid who wants to go into teaching and have him start running with this kid and coaching him. If it's art, find somebody who does that – find a mentor that can stick with them. And then the third thing is find somebody in their culture – find their story. You know, connect them to somebody in that broader world who they can feel like they belong to. So, it really is about facilitating connection. (John)*

Relationships are protective and support healing. The next subsection moves to discussing how attachment theory informs the neurodevelopmental lens understanding of relationships.

Attachment theory and the neurodevelopmental lens

Attachment theory informs the neurodevelopmental lens (Perry, 2002, 2009). According to the neurodevelopmental lens and attachment theory, relationships are a major mediator of the reactivity of an individual's stress response system and helps them to return to a state of calm more quickly (Beeghly et al., 2016; Perry, 2001, 2009; Ungar, 2005). Infants and

children[32] are reliant on their caregivers for care, protection, and developmental experiences; with experiences of childhood adversity often occurring within a relationship or the family setting. Attachment theory, first posited by Bowlby (1958, 1969, 1973, 1988), is frequently used to explain the nature of the relationship between a child and their parents. Bowlby's original theory posited the bonds formed between children and their caregivers provided important patterns for how children would relate to others later in life and their social and emotional functioning. The attachment system means the child seeks proximity to their caregiver when the child is afraid. For example, a loud noise startling the child makes the child cry and the parent would comfort them. When the child feels sufficiently reassured, they can move away from their caregiver and return to exploring the world around them. Over time, consistent, repetitive, nurturing care sensitive to the needs of the child, supports the healthy development of the child's social, self-regulation, cognitive, and emotional capacities (Fearon & Roisman, 2017; Granqvist et al., 2017; Harlow, 2021; Ludy-Dobson & Perry, 2010; Perry, 2009; Schore & Schore, 2008). A child's relational template is a pattern upon which all future relationships need to be considered (Perry, 2002). This provides insight into why a child may react in a certain manner as explained by John:

> *All person-to-person interactions will be filtered through these previous associations that you made earlier in life. And that will influence, sometimes in negative ways, the way the interaction is experienced. So that sort of brings you to a little bit of attachment work because the way your brain organises and the associations you make about relationships comes from your early attachment experiences. (John)*

However, when a child consistently does not have their needs met, or they experience fear that is not alleviated by their caregiver or is caused by their caregiver, then the child's relationships and development are likely to be impaired (Dawson et al., 2014; Perry, 2009). Differences in the responses from the infant to the caregiver led to the development of an experiment, the

[32] The term children is used moving forward in this section to make it easier to read but also to highlight children of all ages, not just infants, require attuned, responsive parenting.

Strange Situation Procedure, to support researchers to categorise and describe a child's attachment to their caregiver in a standardised manner (Ainsworth et al., 1978; Granqvist et al., 2017; White et al., 2020). The procedure seeks to understand how the child explores an unfamiliar room and responds to their caregiver when mild distress is elicited through brief separations from their caregiver leaving. The child's responses were categorised into four categories of attachment styles:

- Secure – the child shows distress on the caregiver leaving but can be quickly comforted by them on their return.
- Insecure-avoidant – the child demonstrates little signs of distress upon the caregiver leaving.
- Insecure-resistant/ambivalent – the child demonstrates distress before separation, and then it is difficult to settle on the caregiver's return.
- Disorganised – the child does not display a consistent response throughout the procedure and may freeze, hit their caregiver, and avoid eye contact with their caregiver after appearing pleased to see them before reverting to another attachment style (Granqvist et al., 2017; White et al., 2020).

Over time, attachment theory, particularly in relation to the disorganised categorisation, has been used in child protection social work practice and has become a framework for practitioners to be able to assess the child-parent/caregiver relationship and the social and emotional functioning and behaviour of the child (Keddell, 2017b; White, Gibson, et al., 2019). Disorganised attachment with a caregiver is thought to develop when the caregiver is a regular source of alarm for the child, for example, frightening behaviour, the caregiver being psychologically unavailable, or the caregiver being subject to family violence (Granqvist et al., 2017). The child's attachment system seeks proximity to the caregiver, but the child may also find them frightening, leading to disorganised attachment behaviours. With a caregiver being a source of alarm, it becomes clear how an association between disorganised attachment and child maltreatment has developed (Cyr et al., 2010; Granqvist et al., 2017). Whilst some

children who experience maltreatment will develop a disorganised attachment; not all will, with many who have experienced maltreatment not receiving a disorganised classification. Other factors, such as socioeconomic risk factors, also have been associated with the development of maltreatment. A disorganised attachment style (or lack of it) is not indicative of maltreatment (Cyr et al., 2010; Granqvist et al., 2017; White et al., 2020).

Disorganised attachment is a risk factor (along with others) for the development of problems with social and emotional functioning; although there is a small to moderate effect size, meaning a child with a disorganised attachment style is at greater risk of developing behavioural problems, but will not necessarily do so (Fearon et al., 2010; Fearon & Roisman, 2017; Granqvist et al., 2017; Groh et al., 2014; Groh et al., 2012; Madigan et al., 2013; White et al., 2020).

Several other limitations and assumptions arise with attachment theory (for a comprehensive discussion see Granqvist et al., 2017; and White et al., 2020). Firstly, the Strange Situation Procedure was developed with a non-clinical, middle-class, white population, making it difficult to generalise to other populations and cultures (White et al., 2020). The assessment of attachment requires great skill and caution, and there are limited means of reliably doing so in the home environment (Granqvist et al., 2017). Secondly, attachment styles are not static and are therefore open to environmental influences and are able to be changed with changes within the environment– this is important as it speaks to the capacity for change when the right supports are put into place for families (Fraley & Roisman, 2019; Granqvist et al., 2017; Levendosky et al., 2011; White et al., 2020). Thirdly, there is a risk that attachment theory can be used to pathologise and blame parents. There are multiple factors, including socioeconomic factors, which influence attachment style, and maltreatment does not necessarily lead to a disorganised attachment style (Cyr et al., 2010; Granqvist et al., 2017; White et al., 2020).

Another challenge with traditional applications of attachment theory is that the assessment of attachment is typically seen as a dyadic relationship with the caregiver and does not reflect the reality of the child's world with multiple caregivers and networks of support (Granqvist et al., 2017). Children can have different attachment styles with different caregivers (Granqvist et al., 2017; White et al., 2020).[33] This can lead to a perpetuation of Western, patriarchal conceptualisations of parenting, with the mother often being responsible for most of the parenting and, therefore, being at fault if the child develops an unhealthy attachment (Joy, 2022). Within Aotearoa New Zealand, Māori have a worldview where children are seen as interconnected as part of the bigger system and a collective approach to raising tamariki (children) is utilised (Flemming, 2016, 2018; Pihama et al., 2021). Mere explained:

> *Māori knowledge would say that all, everything is interconnected, and nothing exists outside of itself… which is why there's no individual. We're all part of a group. It's the same with our whole belief system. It's all interconnected as well, and nothing exists of itself, and everything is connected to everything around it. So, if something's not going down well in the environment it's going to affect me. (Mere)*

The primarily dyadic assessment of attachment is particularly problematic within collective cultures (for example, Māori and Pacific communities) where children are seen as interconnected and a collective approach to raising tamariki occurs (Flemming, 2016, 2018; Mafile'o, 2019; Pihama et al., 2021). Flemming (2018) commented:

> Both indigenous and Western approaches to attachment share this emphasis on the importance of reliable, consistent, attuned and responsive adults being available to children. However, attachments and connections beyond the interpersonal dyad also hold priority with regard to development for Māori. The ongoing dominance of Western developmental theories and interpersonal dyadic relationships has marginalised mātauranga Māori (Māori knowledge), particularly around the

[33] Bowlby's (1969) original articulation of attachment theory highlighted this point. Since Bowlby defined attachment theory, there has been a shift in attachment research towards a more dyadic focus.

> importance of collective interpersonal attachments and extrapersonal attachments. (Flemming, 2018, p. 25)

As Flemming (2018) highlighted, theories that focus on dyadic attachment relationships can marginalise mātauranga Māori, with Māori having multiple caregivers involved in caring for their children. Whilst attachment theory has focused largely on dyadic relationships, the neurodevelopmental lens addresses the critiques by focusing on multiple relationships. This means one relationship is not prioritised over others, by recognising that all relationships influence the child: "The number, quality, and stability of relational interactions matter to the child" (Perry, 2009, p. 248). The key informants echoed the neurodevelopmental lens view of the importance of children and young people having multiple relationships:

> *But for our kids, it's really important that they are connected to something which we call tūhonohono – having positive healthy connections. It's really important they have those and that's really important they can tell that story. I think positive youth development says that there are four wheels that are very crucial to young people – it is whānau, it is school, it is the community, and it is their peers. And they should be able to find, you know, connections within each of those dimensions to remain well and healthy. (Mere)*

> *Connection is a buffer – connectivity, the more connected you are to family, community, culture. And, again, this is different for different kids. You know, sometimes the connection comes through sport, you know being good at sport. Sometimes, it comes from being good in dance. (John)*

The neurodevelopmental lens focuses on multiple relationships that support a child. This multiple relational focus addresses critiques of the dyadic focus of attachment theory. The key informants highlighted that connection, including to the child's culture is also important. The

next subsection extends the literature review discussion on the importance of connection to culture.

Connection to culture

An individual's connection to their culture is an important aspect of development and well-being. Culture is a core part of an individual's identity, who they are, and how they relate to the world and with others and informs our beliefs and actions (Fast et al., 2019; Harder et al., 2020; Krakouer et al., 2018; Mafile'o, 2019; Pihama et al., 2021; Reid et al., 2016). Krakouer et al. (2018) noted culture has a direct influence on the child's development. Within an ecological framework, Krakouer and colleagues argued that culture should be located immediately surrounding the individual and not within the macrosystem as it traditionally is. This is because they framed culture as "a lens through which the child interacts with their environment and through which people and systems view the child" (Krakouer et al., 2018, p. 271). The relocation of culture to immediately surrounding the child highlights the direct impact that culture has on development, health, and well-being (Krakouer et al., 2018). Key informant Anna provided a rich insight into how she views culture:

> *I think culture is in everything. It's in what we say, it's in what we do, it's in how we are with people, it's in how we greet people, it's in our food, it's in our music. It kind of permeates through us, and it's who we become, and it's who we are. And actually, if you take that away, people kind of are a little bit adrift, in my mind. (Anna)*

Anna related connections to culture with well-being, aligning with the extant literature. Strong cultural connections (particularly for indigenous people) are inseparable from well-being (Fast et al., 2019; Harder et al., 2020; Krakouer et al., 2018; Pihama et al., 2021). Culture is, therefore, integral to who we are and "culture is an holistic entity that permeates all aspects of a child's life" (Krakouer et al., 2018, p. 270).

An understanding of culture develops through experiences and relationships with family (Krakouer et al., 2018; Schwartz, 2007). A sense of belonging and connection to family, community, and culture are important aspects of identity development and well-being and can be protective and healing against the effects of childhood adversity (Durie, 2011; Fast, 2014; Krakouer et al., 2018; Mendes et al., 2016). Yet, the extant neurodevelopmental lens literature has a limited focus on culture, instead focusing on relational connections (Cox et al., 2020). Within the neurodevelopmental lens theoretical literature, the importance of connection to culture is briefly mentioned as a protective factor (Hambrick, Brawner, & Perry, 2018; Perry, 2001, 2008) and culturally respectful relational interactions are stated as core elements of the NMT (Perry, 2020; Perry & Dobson, 2013); however, how this is achieved is not elaborated on further. Perry (2020) has recently recognised the need to develop culturally sensitive training for the neurodevelopmental lens. Despite the limited focus within the neurodevelopmental lens literature, the key informants viewed connection to culture as an important consideration for the neurodevelopmental lens:

> *We do think that cultural belief system, connection to your culture, your people is a very powerful thing. And we try to encourage and facilitate it. (John)*

Following this excerpt, John associated connection to culture with a sense of belonging as the experiences, beliefs, and actions were familiar. The consideration of culture is particularly important within the Aotearoa New Zealand context where this research was conducted. As mentioned within the introduction chapter, Māori have experienced forced colonisation and oppression, which include intentional attempts of assimilation (for example, the marginalisation of te reo Māori – the Māori language, and traditional Māori healing practices) into Western culture (Hyslop, 2022; Keddell et al., 2022). Colonisation has also resulted in (ongoing) isolation and disconnection for Māori through the destruction of traditional whānau structures (Hyslop, 2022; Joy, 2022; Keddell et al., 2022; Pihama et al., 2021). This has a significant impact on well-being, with Reid et al. (2016) noting:

> For Māori, culture and identity are fundamentally built on the reciprocal relationships formed with *whānau* [extended family] and *whenua* [land/place]. Thus, the loss of *whenua* during colonisation not only created intergenerational economic problems for Māori, but also compromised cultural and psychological wellbeing. (emphasis in original; Reid et al., 2016, p. 32)

As Reid et al. (2016) explained, connection to both people and land is important for Māori. Flemming (2016, 2018) expanded on the connections to whenua and whānau, highlighting four connective structures important to Māori well-being: wairua[34]; whenua; whānau, hapū, and iwi; and māramatanga (understanding and knowledge). Flemming details that colonisation has had a direct impact on the manner within which Māori engage with these structures. The inclusion of wairua (spirit, soul of a person) and māramatanga (which can be considered to be aspects of Māori culture) by Flemming (2016, 2018) further reinforces that culture is inseparable from people. Pihama et al. (2021) further explained the important links between connection to people, culture, and well-being for Māori:

> For our people who experience disconnection from hapū and iwi, who live outside of or have little access to their iwi or have through various state mechanisms been removed from their whānau, the ability to maintain whakapapa ties can be more challenging… The need to maintain connections and to link each other through whakapapa is a critical element in knowing who we are, not just as individuals or whānau, but in terms of the depth of our relationships to each other, and therefore our roles, responsibilities, obligations and accountabilities to each other. (Pihama et al., 2021, p. 25)

[34] A state of connectedness between the universe and Māori; this includes connection to land, seas, stories, songs, and marae and waka.

The views of Flemming (2016, 2018), Pihama et al. (2021), and Reid et al. (2016) were reinforced by key informant Mere. Mere advocated for greater connection of children to their whānau, hapū, and iwi; disconnection for Māori impacts on well-being:

> *Māori are a collective people, we like to be together… We are not well when we are on our own, and that's a really important thing to remember that you remove us from any collective that we put around us and we will be unwell if we're isolated. (Mere)*

The inseparable connections between culture, whānau, and well-being have important implications for child protection social work practice and the neurodevelopmental lens. Colonisation has resulted in significant, long-lasting, and intergenerational social and economic impacts, creating an overrepresentation of Māori in numerous systems, such as child protection, corrections, and mental health (Hyslop, 2021, 2022; Keddell et al., 2022). Adversity can further perpetuate the impacts of colonisation through both relational and cultural disconnection, which has been found to affect well-being (Carriere & Richardson, 2009; Fernandez, 2008; Krakouer et al., 2018; Mendes et al., 2016; Pihama et al., 2021; Schwartz, 2007). Research into experiences of foster care has found that being in the foster care system can contribute to feelings of disconnection from culture and lack of belonging (Fylkenses et al., 2021; Johnson et al., 2020; Skoog et al., 2015; VOYCE - Whakarongo Mai, 2022). For example, children who enter foster care are often separated from their families and, if placed outside of their families, will also experience cultural disconnection (Carriere & Richardson, 2009; Fernandez, 2008; Krakouer et al., 2018; Mendes et al., 2016; Pihama et al., 2021; Schwartz, 2007). Joy (2022) observed that the state fails to recognise (nor acknowledge) the impacts of colonisation on cultural connections for tamariki Māori (Māori children) and that entry into state care further perpetuates these impacts. This is especially important given a child's cultural connection is a fundamental human right established under the United Nations Convention on the Rights of the Child (UNCROC, Articles 7, 8, 9, 30, and 31; Fitzmaurice-Brown, 2022; Harder et al., 2020) and United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP; Fitzmaurice-Brown, 2022).

The second implication of a child's connection to culture for child protection social workers using a neurodevelopmental lens relates to the planning of interventions. Connection to culture is a protective factor and may contribute towards overcoming the effects of adversity (Hambrick, Brawner, & Perry, 2018; Perry, 2001, 2008, 2020; Perry & Dobson, 2013). Fast (2014) described how culture relates to healing: "Healing can only happen when a strong, coherent sense of identity is achieved: thus cultural and emotional needs are not two separate entities, but both integral parts of the healing process for Indigenous peoples" (Fast, 2014, p. 182). Supporting relationships, which help children understand their culture, can build networks of support, including connection to the child's marae (meeting place), hapū, and iwi (Munford & Sanders, 2021; Pihama et al., 2021). The key informants provided insight into how they supported children to develop a cultural connection and belonging. Mere said that for Māori, this means empowering the whānau as whakapapa connections are vitally important and can bring about healing for children:

> *I know Whaea Dame Tariana[35] would very much say that the whānau has all the skills and keys to heal themselves… From a te ao Māori perspective, I actually agree with her – it's the whānau, hapū, iwi who hold the keys. (Mere)*

Social workers typically do not hold the knowledge of the whānau, hapū, and iwi (unless they are related to their client) to facilitate the sense of cultural connection and belonging. As such, Mere explained that the social worker's role becomes to identify and support the person (or people) who can facilitate, nurture, and support the connection and integration of the child into their whānau, hapū, and iwi:

> *I would be really looking at what would a Whānau Ora [family well-being] approach… How could that come into here and help this whānau and connect them into someone who is actually going to journey for the longer term? (Mere)*

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[35] Whaea Dame Tariana Turia is a respected Māori leader and former Member of Parliament and co-leader of Te Pati Māori (The Māori Party).

Furthermore, the key informants explained when selecting interventions (which are developmentally appropriate as discussed previously) drawing on the neurodevelopmental lens, these should ideally be activities from the child's culture. The key informants provided insight into how cultural activities can be utilised to support healing:

> *You can do things like waiata, sing a song, and pray for your food in Māori or whatever you do in your home, you can do some things that kind of come naturally. You can connect them to some kapa haka groups because that's all rhythmic, repetitive stuff, you know… Culture, for me, if we can actually do some of that and utilise some of that, I think it's a wonderful vehicle for bringing about healing. (Anna)*

Anna described how activities drawing on a child's culture are connected to the principles of a neurodevelopmental lens in two ways. First, these are regulating and often somatosensory in nature. Research into traditional Māori cultural activities (such as poi [a light ball on a string swung rhythmically], waiata, kapa haka, and flax weaving) have been found to have grounding and regulating effects due to their somatosensory nature (as discussed previously in the regulate section of the engagement and intervention sequence; Elder, 2013a; Elder, 2013b; Hollands et al., 2015; Kirkwood, 2015; Sirs & Meek, 2021; Sweetman, 2017). Secondly, they build a sense of connection and belonging by enabling the child to develop a deeper understanding of their cultural practices and have access to supportive relationships (Elder, 2013a, 2013b; Hollands et al., 2015; Kirkwood, 2015; Sirs & Meek, 2021; Sweetman, 2017).

This section has discussed the neurodevelopmental lens principle of relationships and has also explored the broader literature related to cultural connection and belonging. Supporting relational and cultural connection and belonging is important as adversity can result in cultural and relational disconnection. especially if the child enters into foster care. The next section explores the literature and findings from the key informant interviews relating to the

mesosystem and introduces the concept of a therapeutic web to coordinate interventions and support across the various microsystems surrounding a child.

The mesosystem

The mesosystem builds on the microsystem by considering the interactions between the child's various microsystems. For example, the mesosystem includes the interactions between a child's parents and school. The neurodevelopmental lens literature and findings from the key informant interviews emphasised the importance of facilitating many therapeutic moments throughout a child's day. This requires coordination and planning across the various microsystems. The NMT model utilises an approach referred to as the therapeutic web (a network of adults, and at times peers, working with the child). The therapeutic web approach and how this can build a shared understanding of the impacts of adversity across systems, including how the therapeutic web can support the coordination of interventions across the various microsystems surrounding the child, is explored in the following paragraphs.

Creating a therapeutic web

A central component of the NMT model (which is informed by the neurodevelopmental lens) is the creation of a therapeutic web, which is the network of adults (and, at times, peers) of the child who are invested in supporting the child (Perry, 2020; Perry & Dobson, 2013). Establishing a therapeutic web is the first area of recommendations under the NMT (Perry, 2020; Perry & Dobson, 2013). As has been already established, the neurodevelopmental lens recognises the importance of relationships across multiple environments, for example at home and at school, and the use of repetition of activities that have been selected to support the child (Perry, 2008). To achieve this, there must be alignment between the various environments and people surrounding a child – this is what is meant by the principle of creating a therapeutic web (Perry, 2008, 2020; Perry & Dobson, 2013; Ungar, 2005). Perry (2020) noted that the therapeutic web is important to build a shared understanding and capacity to provide

therapeutic care as "maltreated children can present with complex and confusing problems that even a team of professionals do not understand. This is where a capacity-building and ongoing psychoeducational approach is essential to help them help their child" (Perry, 2020, pp. 147-148).

The key informants also recognised that change does not occur within an individual alone. Instead, the lens requires a focus on developing a therapeutic environment around the child. This provides children with as many opportunities as possible to receive therapeutic input throughout the day. In the context of the neurodevelopmental lens, therapeutic input can be activities or interventions supported by the approach, such as somatosensory input to support regulation, or strengthen healthy relationships:

> *Counselling is one hour a week – it's not the solution. If you have a week of 168 hours, to do it 1 hour a week is not going to bring about the change. It's about how we do it across the environments. (Anna)*

Anna highlighted the need for the various environments to work together to bring about healing for the child. Anna suggested that the neurodevelopmental lens may be more effective than counselling alone as the lens incorporates regular repetition of interventions throughout a child's day and week.

Research into resilience echoes this as the individual and their environment, at multiple levels of the ecology, interact to optimise human development (Ungar & Perry, 2012).[36] Resilience is seen as a process, rather than a trait, where an individual (is supported to) navigate and negotiate for resources to be provided in a meaningful manner (Ungar, 2005; Ungar & Perry, 2012). This is supported by Munford and Sanders (2021) who advocated for social workers to work with the wider systems to ensure that clients receive support and advocacy for their

[36] See Ungar and Perry (2012) for a discussion of how resilience and the neurodevelopmental lens are related concepts.

needs to be met. Whilst their research focused on working with young people, the findings are applicable to all children. Through developing a holistic understanding of the child or young person, the social worker is better able to provide support and advocacy across multiple levels of the system to create a therapeutic environment (Munford & Sanders, 2021; Ungar, 2005; Ungar & Perry, 2012). Through working with the mesosystem (the therapeutic web), social workers can coordinate across the various microsystems with which the child is involved. What is unique about the neurodevelopmental lens approach is the selection of developmentally appropriate interventions, with these occurring across multiple levels of the system (Cox et al., 2021; Perry, 2009). Commenting on the neurodevelopmental lens, Cox et al. (2021) noted: "Each intervention utilised a trauma informed developmental lens, however, the type of intervention differed based on the child developmental stage and the family and system's understanding of the ecological system for the child" (Cox et al., 2021, p. 14) with the approach improving measures of relational health for the child through working with and strengthening the child's support network.

Traditional talking therapies are unlikely to be developmentally appropriate, at least initially, for children who have experienced adversity as they rely on high levels of cortical processing and the child's developmental needs are more likely to be the development of regulatory or relational capacity (Perry, 2009). Over time, as the child develops greater self-regulation and relational ability, traditional talking therapies will become more appropriate as the child has the functional cortical capability to process their experiences using language (Perry, 2008, 2009). However, initially, the neurodevelopmental lens would recommend focusing on developing a sense of safety (i.e., reducing opportunities to activate the stress-response system), self-regulation abilities, and relationships (Greer, 2015, 2021; Perry, 2009).

The neurodevelopmental lens enables and facilitates a cohesive approach which allows for therapeutic moments (such as regulating somatosensory activities) to be spread throughout the day and repeated many times (Perry, 2006, 2008, 2009). The interventions selected may

focus on strengthening one function, for example, self-regulation (Perry, 2009). We learn to write through repetition and trial and error. Similarly, to develop a function such as self-regulation children must be supported to master this ability through repetition. As such, the neurodevelopmental lens would ensure opportunities for regulation (typically through somatosensory activities) are scheduled throughout the day on numerous occasions, across settings, and wherever possible done in parallel with an adult (to provide positive relational interactions). These therapeutic moments are often short (5-10 minutes). The frequent repetition of activities reflects the principle that the brain develops through experiences (Perry, 2008). Anna explained the role of the social worker is not necessarily to do the interventions but to coordinate and support the various systems to implement the interventions. Interventions were also said by Anna to be relatively brief in nature (a matter of minutes and may be incorporated into the child's daily routine – for example, changes to sleep routines or food choices) but are repeated through a child's day to create multiple therapeutic moments:

> *So, we do a before-school slot, 2 slots at school, an after-school slot, and an evening slot. So, we [the social worker and the therapeutic web] do five slots, and we look at what can we build into those slots in terms of the rhythmic, repetitive activities that are also sensory and also relational. So, if we're just thinking in terms of our oral sensory experience, it may be a smoothie in the morning, it could be a crunchy apple at morning teatime, it may be a thick yogurt at lunchtime, an afternoon snack would be a crunchy nut bar, and they may have another thick smoothie before they go to bed. So, it's just kind of the dosing of those oral activities. (Anna)*

This detailed thinking about how a child can have therapeutic experiences situated within positive interactions and relationships promotes a holistic approach. Mere identified the

congruence between the holistic approach of a neurodevelopmental lens and indigenous Māori approaches, such as Te Whare Tapa Whā[37]:

> *But if you think of it in Te Whare Tapa Whā, in order for the hinengaro [mind] to be well, it needs to be connected to those other walls. And they all need to be stable. So, if, you know, if something is going down in the whānau, it's gonna affect the kids… So, if one of your walls isn't right, if your wairua wall, your tinana [physical] wall, your physical well-being is not good – it's kind of, everything affects each other. (Mere)*

Moreover, the child feeling a sense of safety, both physically and emotionally, across their environments is important. Social workers advocate for the child's (and their family's) needs to be met across multiple domains. (Munford & Sanders, 2021; Ungar & Perry, 2012). Mere said:

> *If you can give them a good, solid grounding in a home that is loving and caring, that is focused on them as an individual to be safe. You know, thinking of Maslow's Hierarchy of Needs, if you can do all those baseline stuff and give them a safe, warm home environment, fed, watered, clothed, they will thrive. (Mere)*

Mere highlighted the importance of creating a safe environment. Supporting changes in the individual's environment can be more effective than trying to support individual change (Ungar, 2013b; Ungar & Perry, 2012). Yet, this can be challenging as different systems have competing interests (Ungar & Perry, 2012). For example, a mental health service may want the child to have breaks away from school, whereas the school wants the child in school. Ungar (2005) noted: "Systems that deliver services must be designed to provide health resources that

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[37] Te Whare Tapa Whā is a Māori model of health and well-being developed by Sir Mason Durie. The model draws on an image of a wharenui (Māori meeting house) with the strong foundations and four walls. Each wall is interconnected and reliant on the others. The model has four dimensions for Māori well-being: taha tinana (physical health); taha wairua (spiritual health); taha whānau (family health); and taha hinengaro (mental health). All four dimensions need to be present and well in order for a person to be collectively well.

are reasonably accessible and available in a timely manner… However, those who use what the system provides must have some say in how and when they get (and take) what they need" (Ungar, 2005, p. 430). The therapeutic web of the neurodevelopmental lens provides a framework through which the multiple systems around the child can hopefully develop a shared understanding of the child's (and their family's) needs and develop a holistic plan centred around these.

This section has outlined how the NMT concept of a therapeutic web can be used to work in a collaborative way across a child's systems. The therapeutic web may support building a shared understanding of the child's needs and strengths and coordination of interventions across the child's day. The literature review discussion now turns to the broader systems (the exosystem and the macrosystem) which the child is not directly involved with, yet still impact on the child and their family.

The exosystem

The exosystem is the broader environment surrounding the mesosystem. Whilst the exosystem does not involve the child, the exosystem still has an impact on them. For example, a child is typically not involved with their parent's workplace, yet a parent's employment could be a supportive environment, providing social support, or it could be stressful and unsupportive, resulting in increased stress levels for the child's parents. Changes within the exosystem, therefore, according to the ecological-transactional perspective, interact with the child's development in ways that are protective or adverse (Cicchetti & Lynch, 1993; MacKenzie et al., 2011).

Whilst within the neurodevelopmental lens literature there is a minimal focus on the exosystem, important points are raised. The literature describing the NMT highlights the second area of recommendations (following the establishment of a therapeutic web) is focused

on the child's family (Perry, 2020; Perry & Dobson, 2013). Recommendations relating to the family should seek to address vulnerabilities and build on the strengths of the family. Perry (2020) noted that additional stressors can make it difficult to provide therapeutic care. The provision of additional support for parents (such as therapeutic input) may be located within the exosystem. The ecological-transactional perspective suggests approaches, such as those described by Perry (2020), where vulnerabilities are addressed, and strengths built on as these indirectly affect the child. The discussion now moves to the broadest level of the ecological system, the macrosystem.

The macrosystem

At the broadest level of the ecological-transactional perspective is the macrosystem, which encompasses societal culture and factors such as socioeconomic position, wealth, poverty, and societal norms. Within the existing neurodevelopmental lens literature, there is limited explicit focus on the macrosystem. However, within the broader literature relating to development, there is an increasing recognition of how elements of the macrosystem impact development. Engaging with and challenging societal structures is central to the profession of social work (Hyslop & Keddell, 2018; IFSW & IASSW, 2014), and therefore, consideration of the macrosystem is essential to any social work research. Whilst the neurodevelopmental lens typically focuses on the systems immediately surrounding the child, considering how broader systems impact these inner systems (such as the micro and meso systems) is congruent with the approach.

Research focusing on social determinants has found that factors such as poverty and economic inequality are associated with health outcomes and child protection involvement (Bywaters et al., 2018; Featherstone et al., 2017; Keddell & Davie, 2018; Keddell et al., 2019; Marmot, 2017). Researchers have identified strong links between social problems, inequality, child maltreatment, and ill health (Bywaters et al., 2016; Eckenrode et al., 2014; Featherstone et al.,

2017). Poverty has been found, internationally and in Aotearoa New Zealand, to directly increase the likelihood of children being involved in the care and protection system or ending up in state care (Featherstone et al., 2017). Bywaters et al. (2016) summarised it well: "The greater the economic hardship, the greater the likelihood and severity of CAN [child abuse and neglect]" (Bywaters et al., 2016, p. 4). However, this does not mean that all children in poverty experience abuse or neglect. Aotearoa New Zealand research by Keddell et al. (2019) explored the social gradient of child protection (the difference economic advantage or disadvantage makes on the likelihood of child protection involvement). They found children living in the most deprived areas were significantly more likely than those in the least deprived areas to have abuse substantiated, be referred for an FGC (up to 18 times more likely) or end up in care (six times more likely). Keddell and colleagues theorised that these significant disparities could be considered using an intersectional approach:

> One posits that it is caused by multiple interrelated factors such as increased incidence due to poverty-related stress, poor fit between demand and supply of preventive services, and the increased surveillance of some communities while others are nearly invisible to monitoring (Johnson-Reid, Drake, & Kohl, 2009). Another strand of theorising proposes that it is the intersecting nature of ethnicity and poverty [that] is at play, as Indigenous people may be more exposed to intersecting class and ethnic biases and are over-represented in highly deprived areas. (Keddell et al., 2019, pp. 6-7)

Utilising the ecological-transactional perspective provides greater insight into the nature of the intersecting factors that impact children and their families and how these factors can contribute to child abuse and neglect. There are direct factors that impact families, such as material hardship and an inability to access or buy in support or better environmental conditions, and indirect factors, such as increased levels of parental stress, loss and shame, or neighbourhood conditions (Bywaters et al., 2016; Featherstone et al., 2017). In line with the ecological-transactional perspective, Bywaters et al. (2016) highlighted that "the interactions

between poverty and other contributory factors are complex and frequently circular. For example, poverty increases the risk of mental ill-health and mental ill-health increases the likelihood of poverty" (Bywaters et al., 2016, p. 4). The complexity of the impact of poverty was reflected on by the key informants, for example:

> *Poverty becomes all-consuming, and, therefore, they are unable to see a way out. And so, they just are trapped in the cycle and that's what they pass on to the kids. (Mere)*

Aligning with an ecological-transactional perspective where risk factors within the macrosystem interact with the inner systems, Mere described the impact of the macrosystem on parents, which then has an impact on children. This understanding of the relational link between structural factors, parenting, and child development aligns with the family stress framework found in the literature (Bywaters et al., 2022; Conger, 2000, as cited in Bywaters, 2022; Duncan et al., 2014; Evans & Kim, 2013; Granqvist et al., 2017). The family stress theory provides a further understanding of these interactions. The theory suggests that families experience more stress as a result of poverty, resulting in higher levels of psychological distress and affecting parents' capacity to care. This may then affect the child. As discussed above in the exosystem section, addressing additional stressors (such as the impacts of poverty) for the child and family is an important aspect of the neurodevelopmental lens, as this ensures there is the capacity for providing therapeutic care (Perry, 2020).

A second area of the macrosystem concerns how societal structures relate to cultural backgrounds. In Aotearoa New Zealand there is increasing recognition of the intergenerational impact of events, such as colonisation. Intergenerational or historical trauma refers to the impact of traumatic events that are transmitted through generations (Conching & Thayer, 2019; O'Neill et al., 2018). Intergenerational or historical trauma can affect mental and physical health and lead to poor systemic outcomes across generations (O'Neill et al., 2018; Pihama et al., 2017; Reid et al., 2016). As already noted, Māori are

significantly represented in several systems, such as criminal justice and child protection, and have poorer outcomes than tauiwi (non-Māori) (Hyslop, 2021, 2022; Keddell et al., 2022).

The poor outcomes and overrepresentation in negative statistics lead to marginalised groups (such as Māori) and the impoverished being framed within the Western dominant neoliberal as risks needing to be managed (Hackell, 2016; Joy, 2022). Neoliberal ideology emphasises personal responsibility for an individual's own excellence, health, and well-being; positioning poor outcomes as the result of social irresponsibility by the individual (Hackell, 2016; Morley & Ablett, 2017; Stanley-Clarke, 2015). The neoliberal legitimisation of risk management by government child protection services results in "increased surveillance and policing of welfare recipients under the impetus of rescuing vulnerable children from dangerous adults" (Hackell, 2016, p. 870). This inevitably leads to more children being protected (removed) from their parents and can further perpetuate the harm the child has already experienced (as discussed in Chapter Three).

Broader socio-structural forces located in the macrosystem, such as the impact of poverty and colonisation, have often been overlooked (possibly even ignored) within child protection systems (Bywaters et al., 2016; Featherstone et al., 2017; Hyslop & Keddell, 2018; Keddell et al., 2019). The structural inequities affect the multiple layers of the ecosystem in an interactive manner as described by the ecological-transactional perspective. Featherstone et al. (2017) argued there is "the need to move away from a sole focus on assessing and dealing with individualised risk factors in order to more fully engage with and understand the social determinants of the harms that are manifest in families" (Featherstone et al., 2017, p. 195). This is echoed by Morley and Ablett (2017) who argued that radical analysis of structural factors resulting in economic inequality and marginalisation is needed and for there to be structural responses from social workers to structural injustices (rather than individualised responses which largely support people to cope or adapt).

The extant literature argued it is important for child protection social workers to resist neoliberal ideology and consider and challenge the structural factors affecting families (Bywaters et al., 2016; Featherstone et al., 2017; Hyslop & Keddell, 2018; Keddell et al., 2019; Morley & Ablett, 2017). Engaging with societal structures and individuals and families is the essence of what distinguishes social work from other professional disciplines (Hyslop & Keddell, 2019; IFSW & IASSW, 2014; Morley & Ablett, 2017). Joy (2022) referred to this as a both/and approach. As already established, whilst the neurodevelopmental lens does not explicitly focus on structural factors, the lens is concerned with addressing the impacts of adversity and strengthening the child and their family unit (Perry, 2020). The neurodevelopmental lens is an interdisciplinary framework but should be utilised within the context of the practitioner's professional knowledge, values, and practice. For social workers, this means utilising the neurodevelopmental lens to address the impacts of structural factors affecting a child and their family. Addressing macrosystem risk factors is likely to result in reduced levels of adversity and increased protective factors. Understanding this connection between the neurodevelopmental lens, social work practice, and broader societal impacts is an area requiring further research.

Chapter summary

As highlighted throughout this chapter, there is relatively limited Aotearoa New Zealand research on how the neurodevelopmental lens is used in child protection social work practice. This study drew on interviews with three key informants with expertise in the neurodevelopmental lens and te ao Māori in order to supplement the literature. This chapter has presented the literature and findings from the key informant interviews to provide an overview of the neurodevelopmental lens and its use as a framework for understanding the impacts of childhood adversity. It has also discussed how the lens informs child protection social workers as they plan interventions to help children overcome the impacts of adversity. The discussion has demonstrated that the principles are interrelated and provide a framework

through which a child's history and behaviour can be understood, and developmentally appropriate interventions can be selected. The review of the literature and the findings from the key informant interviews identified significant gaps where further research can be conducted. One such gap is the focus of this research: how child protection social workers use a neurodevelopmental lens in their practice to understand and address the impacts of childhood adversity. Furthermore, the use of an ecological-transactional perspective as the theoretical framework (see Chapter Two) for this research highlighted there is a greater need to research how child protection social workers explore culture and seek to address structural factors (as this is a key focus of the profession of social work) when working with the neurodevelopmental lens. The literature and key informant findings presented in this chapter informed the interviews with the participants. The next chapter presents the research findings from the participant interviews.

Chapter Five: Findings – Social workers' perspectives

The preceding chapters have established the foundation for the research. The methodology, methods, and theoretical framework have been outlined (Chapter Two). The previous chapter outlined the extant literature and incorporated the findings from the key informant interviews. This chapter presents the results from the interviews with the social workers (see Chapter Two for an overview of the methodology and methods). Eleven social workers with relevant experience in child protection social work were interviewed. The interviews sought to address the research aim by exploring social workers' perspectives on how they understood and addressed the impact of childhood adversity using a neurodevelopmental lens. As discussed in Chapter Two, the data gathered from the participant interviews was analysed inductively, allowing themes to emerge from the data. Following this, the data was analysed deductively, drawing on the concepts from the literature and the theoretical framework. This chapter begins with introducing the social worker participants. Following this, the themes from the participant interviews are presented. The themes are:

- Learning about the neurodevelopmental lens.
- Brain development.
- The influence of experiences on development.
- Responding to stress and regulation.
- Attachment relationships, connection, and belonging.
- Working collaboratively.
- Structural factors.
- Advantages and challenges of a neurodevelopmental lens.

Social worker participants

The participants had diverse backgrounds and extensive experience in child protection social work. Some of the social workers had previously been employed within Oranga Tamariki;

however, this was not a requirement for participation. Participants needed to be familiar with a neurodevelopmental approach and the child protection system. Given the small size of the social work workforce in Aotearoa New Zealand, the participants' identities have been anonymised and pseudonyms are used. The participants' pseudonyms, backgrounds, and experiences are outlined in Table 5. All the participants had at least five years of social work practice experience and had a range of practice backgrounds.

Table 5

Participant backgrounds

Name	Current field	Aotearoa experience
David	Private practice supervisor	40+ years
Sheryl	Community NGO	40+ years
Charlotte	Education	5-9 years
Jocelyn	Health, private practice supervisor	15-19 years
Rawiri	Community NGO	5-9 years
Thomas	Private practice	10-14 years
Jane	Community NGO	5-9 years
Amanda	Community NGO	5-9 years
Rebecca	Private practice & foster parent	10-14 years
Tania	Disability	5-9 years
Emily	Community NGO	15-19 years

Learning about the neurodevelopmental lens

The participants had a range of understanding about the neurodevelopmental lens and most had attended training on the approach. Most participants indicated that Dr Bruce Perry's work had influenced their understanding. This ranged from informal training or reading relevant literature to two social workers (Thomas and Charlotte) who had (or were in the process of) undertaking formal certification in Dr Perry's NMT.[38] Other participants (David, Charlotte, and Amanda) spoke about the influence of Aotearoa New Zealand neuroscience educator Nathan Mikaere-Wallis. Several participants had undergone training in the neurodevelopmental lens through their place of employment, such as internal training based on the NMT or training delivered by Grant Sinnamon in his REPAIR model.[39] Tania had pieced together her understanding of the neurodevelopmental lens by linking parts of several trainings. Interestingly, none of the participants mentioned that their social work qualifying training had contributed to their knowledge of the lens. Rebecca criticised her social work training: *"I think the social work degree falls quite short of teaching about neurodevelopmental models, to be honest with you"* (Rebecca).

The participants indicated that for the approach to work, the lens needed to be disseminated broadly and for all parts of the child protection system to buy into it:

> *For the work to focus on this area, we really need to have a change in people's thinking. And we're only going to do that if we get the buy-in from everyone – from the very top to the, you know, to our community agencies, to our community. And I think sometimes what happens is we go, this is a great idea, and we put it onto a specific area, and we don't actually push that out wider. (Tania)*

[38] Certification in the NMT approach requires a minimum of 150 hours of didactic and case-based training.
[39] No literature was identified in relation to Grant Sinnamon's REPAIR model hence it is not discussed elsewhere in this thesis.

Several social workers mentioned supervision as important in learning about and supporting their use of the neurodevelopmental lens. Jocelyn was also a supervisor who used the approach in her practice: *"I use that a bit in my supervision practice talking about brain development"* (Jocelyn). Amanda reflected on how both internal and external supervision helped her utilise a neurodevelopmental approach:

> *It's definitely very helpful that [my supervisor] is on board and kind of supports utilising this theory to change the way that we work. And so, I would have internal supervision with my manager. I also seek external supervision, in which, you know, we can talk about anything that I bring forth, and she helps me to kind of think about how, how I can utilise neurodevelopment more in my own work day-to-day. (Amanda)*

Whilst supervision was perceived as essential to support the approach, not all participants were as fortunate as Amanda. As Thomas put it: *"Ideally, I'd like to have some sort of supervision, peer supervision, whatever, with practitioners who are also familiar with the model, but I haven't found that yet"* (Thomas).

The chapter now turns to presenting the key themes found in the data that supported the participants' understanding of the impacts of adversity and how they used their understanding of the neurodevelopmental lens to inform their intervention planning.

The neurodevelopmental lens: Key themes

Six themes which relate closely to social work practice and the neurodevelopmental lens were identified in the participant interviews and are now presented. The themes are:

- Brain development.
- The influence of experiences on development.
- Responding to stress and regulation.

- Attachment relationships, connection, and belonging.
- Working collaboratively.
- Structural factors.

Brain development

The participants in this study spoke about their understanding of brain development as it relates to the neurodevelopmental lens and social work practice. The neurodevelopmental lens provides insight into a child's current functioning based on the principles of brain development. A key principle of the lens is that the brain develops sequentially. The principle suggests lower parts of the brain develop first before more complex, higher parts of the brain. Emily explained her understanding of the neurodevelopmental lens principle of sequential development:

> *The theory is that our brain develops from the bottom up and it's sequential; in that, you can't develop your higher functioning without having developed your lower functioning. So, you've got to have your survival sorted. And you've got to then have your movement development stuff happen, and then your emotional development and regulation. And then, finally, your ability to kind of think through things and your cognitive functioning. (Emily)*

Emily described how the brain develops from the bottom to the top. The lower parts of the brain are essential functions (such as breathing and heart rate required for survival), with higher cortical functions (such as logical and abstract thinking) developing later. Amanda stated: *"Trauma and maltreatment can inhibit that development… If their brainstem is not fully developed, they're not able to achieve those higher functions"* (Amanda). This means different parts of the brain develop at other times, and the organisation of higher functions is reliant on the correct organisation of lower processes:

If these kids don't have their basic needs, it means that you're putting their brain… their little brains under increased stress, which then has direct consequences for how the different neural systems are going to develop… There's going to be gaps in their development, particularly the higher brain areas, but also, depending on the level and the length of exposure to the stress and intensity of the stress, also in the lower brain areas. (Thomas)

The principle of sequential development was understood to be important to the neurodevelopmental lens as it provides a different approach to understanding children. The participants described that typically, there is a focus on chronological milestones (by teachers, social workers, parents, and others), whereas they viewed a neurodevelopmental lens as considering the child's developmental milestones, resulting in greater empathy for children:

You know, having an assessment that's quite sort of holistic, you can see where people are operating, and it might not be their chronological age, it might be a developmental age. So, a nine-year-old might be emotionally coping at a much lower level. So, we need to respond to that emotional level, not having expectations of being able to be self-controlled as we might have in another year from another child of that same age. (Jane)

Within this excerpt, Jane raised the point that assessments should be holistic, examining the child's current development and functioning. This supports social workers in considering how adversity may have impacted a child's development differently, depending on when the adversity occurred. Consequently, this informs a more developmentally appropriate and empathetic response to the child. Thomas explained how they communicated this understanding to others working with the child:

And so, framing, how the trauma, how that has directly or indirectly impacted the growth of the brain and how it's resulted in certain deficits, and how it's resulted in certain coping mechanisms, and perhaps some strengths as well for this child.

Helping the caregivers and the social workers to connect the dots, I guess, in terms of what we're seeing now in this kid – deficits and strengths and linking it back to early childhood experiences. (Thomas)

The principle of sequential brain development helped the participants understand and communicate how a child's developmental experiences (positive or negative) have impacted the child. This understanding then informed the sequential selection of interventions, which is now discussed.

Sequential selection of interventions

Understanding the sequential nature of brain development was used to guide the selection of interventions by the participants. When a child's lower brain regions are poorly organised, interventions that activate the neural networks in these portions of the brain are selected first. Thomas described explaining to a caregiver the importance of focusing on the lower regions of the brain before moving to higher regions:

She's [the caregiver] quite focused on the academic/cognitive development of these kids and has noticed that there's quite a lag there. And so… I'm trying to highlight the fact that until we tackle the lower brain, and the key functions that aren't functioning… performing well there, she's going to struggle to help the kid remediate the cognitive components that she's observed to be lacking. I think it's getting them to get their head around that – how we structure the intervention plans, focusing on the lower brain structures before we start trying to tackle the functions sitting up higher in the brain. (Thomas)

Different areas of the brain respond to different interventions, and a suitable form of intervention is needed for that area to address functioning issues. For example, learning maths will not necessarily help with learning to draw – different brain regions control these, so different experiences are needed. The participants explained how the same concept is applied

to the lower and higher parts of the brain. Lower areas of the brain, typically associated with survival and regulatory functions, can be targeted using calming, rhythmic, somatosensory activities. Amanda explained her approach to intervention and setting clear expectations for the child's capacity:

> *When we're looking at neurodevelopment and our work with a child, a lot of our work is trying to rewire connections in the brain. And so, primarily, we are focusing on those calming activities and those lower brain functions. And, you know, being able to tap into kind of the child's emotional centre is quite a lengthy process depending on the level of trauma that they've experienced. And so, it's about how we frame our expectations of the child. Being able to, for the child to be able to access that really higher order thinking and performing well at school, actually has quite a lot of steps to go to before they're able to get to that point. (Amanda)*

Here, Amanda explained that initially, the focus is on building the child's self-regulatory ability, controlled primarily through the lower parts of the brain before moving up through the brain to the limbic (emotional and social) and finally the cortex (through talking therapy). The intervention approach mirrors the sequential development of the brain, with lower regions being targeted before higher ones. The child must first be able to regulate their emotions and then form a relationship before more complex interventions such as talking therapy will be effective. Tania discussed the rationale for this:

> *How do you do talk therapy if you ask a kid to talk about a traumatic event and they can't regulate?... And if you don't have that connection to that child to help them bring themselves down, then are you not re-traumatising them by getting them to live through a trauma? And their body reacts to that... with no way of being able to re-stabilise them. (Tania)*

Tania highlighted the sequential nature of intervention. Regulation comes first, followed by relationship and lastly, reasoning (or talking). This understanding informs the selection of

interventions through understanding the child's current functioning. Tania's point is reinforced by this quote from Sheryl:

> *If we're going to be looking at an intervention, the child might be ten, but they still function as a four-year-old. There's absolutely no point in putting, you know… we're not going to go straight into counselling, for instance. So, we're not going to go straight into doing something until we know what the child's capable of negotiating [counselling] safely… So, really looking at the real basic stuff before you even look at therapy. (Sheryl)*

The nature of sequential development is closely associated with the theme relating to the influence of experiences on development, which is discussed next.

The influence of experiences on development

The participants spoke about their understanding of the influence of experiences on development. The participants suggested that experiences (both adverse and positive) have an impact on a child's development, as explained by Tania and David:

> *I guess it's about, you know, them having experiences that make the brain grow and forming the connections between certain aspects. So, as a baby, obviously, when you communicate with them, they're picking up those social cues, all that scaffolding stuff, and all of that. (Tania)*

> *That is the amazing opportunity that we have to enhance the development of the pathways if we provide the right environment… We know from very early studies with babies that are brought up in absolutely passive environments with no eye contact or that sort of thing, their brain development is significantly thwarted, as it were. (David)*

Both Tania and David highlighted a link between experiences and how the brain develops. As the brain develops over time, experiences of adversity can result in prolonged stress, changing how different neural systems develop. The participants understood the brain to be rapidly developing and organising throughout the first few years of life. The participants viewed this period of development as extremely important:

> *The neural pathways are developing, and expanding, and multiplying so quickly, particularly in the first three years. And those are providing, I guess the blueprint for how we view the world, for what our internal working model is. So, for a child under the age of three that's experiencing family violence, not getting their needs met, unpredictable behaviour… parenting. You know, all those different things, they're getting hard-wired, I guess, to be in that survival mode or to be in that brainstem mode. And so, therefore, that's going to impact their development as they get older. (Rebecca)*

As Rebecca explained, children's early years experiences are important for development. When considering the sequential nature of brain development, the participants gained insight into a child's behaviour and functioning. As such, the participants indicated that *"getting a really good understanding of the history of the child"* (Sheryl) is important:

> *It's just looking back at what their experiences have been and how that may have impacted on their intimacy barrier[40] and, you know, understanding where they were in those early years, and you know the impact that could have had on, you know… therefore, they've not had the opportunity yet to develop these good like social skills. They've not had opportunities to develop areas or strategies where they could like self-regulate appropriately. (Charlotte)*

[40] An intimacy barrier is the child's ability to form close relationships with others.

The participants developed an understanding of a child's functioning or behaviour through considering the child's experiences. Experiences were also framed as a key mechanism of change by the participants. Thomas and Jane illustrated this:

> *Ah, repetition. So, lots of positive experiences – positive, safe, repetitive, patterned, rhythmic, somatosensory experiences. Trying to build in lots of those moments throughout the day – minutes, seconds. Yeah, lots of touch points with safe adults – caregivers, teachers, perhaps a coach, family. (Thomas)*

> *Lots of variety of experiences, too. By that, I mean, you know, I'm just thinking of a child who has had a childhood of adversity and the moving through to a place of having a whole variety of experiences that they're engaging [in]. And that gives the opportunity for success, gives the opportunity for enjoyment and recreation. (Jane)*

In these excerpts, Thomas and Jane highlight several key points. Firstly, healing can occur by repeating (often brief) experiences throughout the child's day. Experiences can support children to succeed and should be enjoyable. Thomas also highlighted the role of patterned, repetitive, rhythmic, and somatosensory experiences (discussed further in the next section). He said these should occur alongside relational connections (this is explored further in the section on relationships). The following section explores the theme relating to how children respond to stress and how interventions that draw on patterned, repetitive, rhythmic, somatosensory activities can support the development of self-regulation.

Responding to stress and regulation

A key theme identified in this study was the participants' understanding of the development and functioning of the stress response system as adversity can result in children developing maladaptive responses to stress. The participants indicated that self-regulation becomes a significant challenge for children and young people who have experienced adversity. The ability to self-regulate forms earlier in life and originates in the lower parts of the brain. The

participants explained that the environment a child grows up in has a significant impact on the development of their stress response system:

> *As soon as stress gets elevated, like the Meerkat, the brain is [saying] what's going on here … because the brain is all about self-protection, isn't it? All it wants to do is keep itself safe. And so, for those that have been brought up in chaotic environments, the brain… becomes wired to be alert. Where at the other end of the spectrum is a baby that's been brought up in a very nurturing, warm environment. It's just lying back there like it's on a beach in Hawaii. It almost gets on with stuff, you know. Its trigger to alert is very slow to arise… And so, the meerkats go up very fast and take a long time to come back down again. (David)*

David described how children who are hyperalert respond quickly to perceived threats (using the analogy of a meerkat). It can also take them a very long time to return to a calm state. When children's stress response systems, located in the lower parts of the brain, are activated they typically have different reactions that are broadly grouped as fight, flight, or freeze:

> *I guess it's different for different children because, basically, that brainstem part of it is our fight, flight or freeze. So, those are the kinds of behaviours that you see the basis of. So obviously, fight. Fight tends to probably get the most attention from… particularly from schools or from social workers, because it's the bit that's hard to deal with. It might be the trashing stuff, it might be they're being disruptive, it might be the, you know, arguing, the swearing… And obviously, the freeze part of it is quite often the dissociative part of it, where the child dissociates - they might be really quiet. You know, they might be the opposite. They tend to be overlooked because they've gone into a preservation mode of protecting themselves and kind of shutting down. And then the flight part of it, you know, might be just that they would… It's just that they just want to get away from it. (Rebecca)*

Here, Rebecca explains the different responses to the activation of the stress response system and how a child may present. When children have developed an overactive stress response system because of their experiences, these responses are more common as the child's stress response system may be activated at the slightest perceived sense of danger (even if the child is not actually in danger). Thomas provided an example of this by explaining the activation of the stress response system for a child who was transitioning to a new foster placement:

> *He's read the writing on the wall and realising that, uh oh, this is real. I'm going to have to move there… And so, he's starting to freak out a little bit, and we're seeing that in his behaviour… And actually, he's had some significant meltdowns at his current caregiver's house. And so, I've used this principle to explain this is his stress response. (Thomas)*

The stress of a change in placement creates an understandable level of anxiety and stress for a child. Several participants stated that children with a history of childhood adversity can present with an overly reactive response to situations where they inaccurately perceive being in danger. The participants explained that this is due to changes in the brain's stress response systems. Rebecca shared an example of this:

> *If somebody gives her a fright, you know, like jumps out on her or something, her immediate reaction is to fight. Whereas, you know, perhaps those of us that don't have that trauma-based brain will maybe scream or get a fright, but all the time when we're trying to rationalise ourselves – it's okay, we're safe, we're at home or, you know. Whereas she'll just punch whoever has done it. (Rebecca)*

As Rebecca explained, children and young people who have experienced adversity can become overreactive in response to events. In contrast, someone who has not experienced adversity may get a fright but can quickly regulate themselves. The participants explained how these significant reactions can result in children and young people getting into trouble with

parents/caregivers or schools. Rebecca's narrative also touched on an important theme (a sense of safety) identified within the participant interviews. This is now explored further.

Building a sense of safety

A sense of safety was important to the participants as it closely relates to the child's stress response system. When a child does not feel safe, their stress response system is likely to be activated, resulting in changes in behaviour. Tania explained this:

> *I guess the biggest thing… we always talk about is they need to feel stable first. You know, they need to feel that they are somewhere that it is safe and secure. That is very hard to achieve with these children because they quite often are the ones that will break placements down because of a number of reasons. I guess because they feel like everyone's always let them down, so what's different with this placement?… It is a tricky situation. (Tania)*

A sense of safety and stability is important but can also be challenging to achieve due to children's previous experiences and perceptions related to safety. Charlotte explained the different strategies they used to support the child to feel a sense of safety:

> *I've got a team around the child, sort of working from the bottom up. So, the brainstem is safety. So, what do we need to put in place for the child to feel safe – that maybe the social worker checking in with the teacher in the morning to let them know how the weekend has gone. Has the child's basic needs been met? Are they tired? Are they hungry? You know, so we look at that, and then everyone kind of involved in it. (Charlotte)*

The participants indicated that creating a *"predictable, repetitive, constant environment"* (Sheryl) could establish a sense of safety for the child. Establishing a routine and high levels of predictability and stability were seen by the participants as contributing to a sense of safety.

Creating a sense of safety means the stress response system is less likely to be activated. Rawiri and Jocelyn explained this:

> *So, having predictability, having structure, having a routine allows them to feel secure and safe, and it allows them to control an environment that otherwise they have no control over. (Rawiri)*

> *When there's like chaos, when things are not ordered – I mean ordered enough for the child, they won't feel stable, and so they react to that… And so maybe we're working on sort of one thing about how we're going to sort of create a bit more stability for the child. (Jocelyn)*

Along with stability, routines, and predictability, Thomas added that building a sense of familiarity was also important to building a sense of safety:

> *But I guess I am applying it in the sense that I'm telling the caregivers I'm working with, focus on relationships. Focus on safety. Actually, it starts with safety always of course. So, help this kid to feel safe; help this kid to get familiar with you. So, I'm thinking of another couple that I'm working with – this kid has had like 12, I think, by now, 14 different placements in the space of probably one and a half years or something. So, relationally super-sensitised, plus his own trauma background. And also, these placements are really triggering, obviously, any new placement. And so, I'm trying to get into the caregivers' heads at this point in time – look, all you have to do is get the kid to become familiar with you. Familiarity creates security and safety; that's all we want at this point in time. (Thomas)*

Here, Thomas explained that for a child within the child protection system who has experienced numerous changes in caregivers, another change is going to cause activation of the stress response system. However, if the child has met the caregivers several times before, has spoken to them on the phone, seen pictures of the home, etcetera, the caregivers will be

more familiar to the child, and this means the child's stress response system will be less activated (although any placement change is still going to be challenging).

The participants drew on other theories (such as Maslow's hierarchy of needs) and related these to a neurodevelopmental lens. Maslow's hierarchy of needs was drawn on by five of the social workers as they believed this provided an excellent foundation to understand how this sense of safety can be built into the wider environment, for example, as discussed by Sheryl:

> *It's Maslow, isn't it? But I really think that sort of all of them, ACEs, neurodevelopmental, trauma, all of it. If you haven't got food, water, shelter, you haven't got psychological safety and physical safety, then none of it's going to be possible. Especially for children. (Sheryl)*

As reflected in Sheryl's account, the participants linked Maslow's hierarchy of needs to understanding how to build a sense of safety. If Maslow's hierarchy of needs can be achieved, then children and young people are more likely to feel a sense of safety. Persistent unmet needs will likely create a sense of fear for the child.

The following section explores the findings relating to how social workers supported the development of self-regulation within children.

Approaches to supporting the development of self-regulation

Building an understanding of the presentation and functioning of the stress responses of children who have experienced adversity enables social workers to work more effectively with children who are in a state of dysregulation. Of importance is adopting an individualised approach to the child. Tania explained this: *"It's about learning that kid and figuring out what best is going to help them kind of regulate their emotions"* (Tania). The stress response system originates low in the brain, so drawing on the principle of sequential development, it

is typically one of the first systems to be targeted through interventions. Emily expanded on this:

> *A lot of what we're talking about is, how do we help them to regulate? So, how do we… [give them] experiences that they've missed out on in, you know, in their early years? How can we replicate it now for them in a way that is safe and age-appropriate? So, it's going to help them to regulate, bring them back to baseline and help them to… you know, so that's kind of like how. (Emily)*

The brain develops through experiences, so, as Emily mentioned, if the child hasn't had the necessary experiences to develop self-regulation ability, the child will struggle to achieve this. By providing repetitive developmentally appropriate activities targeted at the lower parts of the brain first, the participants stated that children could develop these abilities later. The participants frequently emphasised the importance of somatosensory, patterned, repetitive, and rhythmic activities as essential to supporting the development of regulation. It is through repetitive calming experiences that children develop their ability to self-regulate:

> *So again, going back to things that we were talking about earlier – the sensorimotor type activities. The almost slowing things down so that it is repetitious, that it's predictable, that it's regulated, patterned, repetitive… So, that you're actually taking them right back [to their early years]. You're calming down their brain. You're actually slowing everything down for that child. (Sheryl)*

The understanding is that somatosensory, patterned, repetitive activities were framed as helping to support self-regulation as they draw on naturally occurring patterns and rhythms. Several participants hypothesised that the importance of rhythm was derived from the patterns and rhythms found within nature. This included the actions parents use to soothe a distressed baby (such as rocking or comforting):

I guess you sort of come back to, like, obviously, when the brain's developing in utero, and the mother's heartbeat and everything being really rhythmic. So, naturally, we take on that pattern because that's what we associate with being safe. (Charlotte)

If it's patterned, if it's repetitive, if it's rhythmic activities, they are the ones that build… that our brains just love and helps your brain to calm. So, what I'm talking about with foster parents is that anything, anything that you would do for a baby – rocking it, rocking a baby, patting its back, you know, jiggling babies, all those things that we do that help them calm. We do them naturally, but our kids who haven't had those experiences, their brains haven't been able to develop that ability to self-regulate. (Emily)

Emily and Charlotte noted that a baby is often soothed by a parent who engages with the child and uses various techniques. The patterned, rhythmic, and sensory input associated with being soothed as a baby, such as rocking, swaddling, jiggling, and patting, can also help support regulation. The participants identified numerous activities that drew on rhythm and movement to help the child to regulate. Rebecca stated: "*The sensory stuff helps them regulate their brain"* (Rebecca). The participants identified different activities that supported a child to return to a state of calm and settle, such as swinging, swimming, kapa haka, deep breathing, biking, singing, rocking, music, and drumming:

Rhythm is a great way for children to calm and settle. You know, like we were trying to find… it's a swing that's a net, but you can just sit in it. And it's not designed for like swinging, but it's designed just to gently rock backwards and forwards, and the kids love it – they'll just pop in there when they're feeling a little bit frustrated, or if they just want to chill out and read a book, they'll go lie in it and just rock backwards and forwards. I think, you know, like you said, kapa haka… all have that… the same thing. It's all about that rhythm. It's all about that movement. And it's all got those components in it that kind of work really well. (Rawiri)

In the same way that rhythm and movement are linked to soothing a baby, touch was also considered by several participants as being important:

> *For some children, and I'm talking about weighted touch, and you can sense just from that [indicates deep pressure touch] whether they're open to being touched because some children just… but that firm, calm touch – they respond well to being held, being rocked, stroked. All of those sorts of very baby-type engagements. (Sheryl)*

The participants stated that building on opportunities for self-regulation by using patterned, repetitive, rhythmic activities throughout the child's day is important:

> *I've been trying to explore with them what somatosensory, rhythmic patterned, repetitive, somatosensory experiences can we build into this kid's life throughout the day, throughout the individual hours that helps to bring the arousal levels for these kids down… What things can they do, what activities can they plan, and how can they come alongside the child and help the child to self-regulate? And then the primary focus at the moment, because of the stage we're in, has been around building in some somatosensory activities. And so, I've tried to help them to structure their day, the kids' days, that there's lots of these little moments, little micro-moments that the kids can naturally come down. (Thomas)*

Thomas described the importance of incorporating regular activities throughout a child's day that provide brief opportunities for regulation. For example, a child might have five or six activities, lasting a few minutes each, spread throughout their day, with each activity being selected to help the child to self-regulate (such as deep breathing, swinging, or a form of exercise). The neurodevelopmental lens informed the participants of the types of activities to use, and they also drew on the child and family's cultural background to ensure that the activities were culturally relevant:

> *When we're able to connect principles of neurodevelopment with tikanga (Māori custom and values) and Māori-dom, we're combining those worlds. So, we're always*

looking for new ways to do that. And I think, I think it's just important to keep, keep an open mind and keep learning. Often, you know, activities that come up that are just, just for fun or just culturally centred can always be related back to some neurodevelopment principle as well. (Amanda)

Rawiri expanded on this and linked several Māori cultural practices to his understanding of the neurodevelopmental lens:

Another programme we do which is really helpful for kids is our kapa haka (Māori dance and chant) programme. And what we do is… they come in, we just say, hey listen, we run kapa haka guys. So, if you're interested in singing haka, mau rākau (Māori weaponry), if you'd like to come and join – no pressure… But also breaking it down even further, kapa haka is good because it's all about rhythm and movement. You know, music is good for the brain. So is the repetitive movement of, you know, like a haka is, ten to 15 repetitive movements repeated over and over. Your waiata (song) is a song at a certain cadence, repeated over and over, and it's very good to stimulate the brain, and it's good to regulate the brain, too, because it's got that rhythmic pattern. You know, it's cyclic, it's rhythmic, and it's a good way to calm people. You know, like when once they get singing… whatever kind of is bothering them melts away because they kind of get into the rhythm, they get into the cadence of the song, or the haka or the mau rākau that we're doing. And it's a good way to engage and teach our kids. (Rawiri)

These culturally based activities draw on patterned, repetitive, rhythmic somatosensory activities that are helpful for the child's regulation. Participating in cultural activities can help a child's understanding of their culture and cultural practices, bringing about a sense of connection and belonging. This is described further in the next theme, the importance of attachment relationships, connection, and belonging.

Attachment relationships, connection, and belonging

Relationships are a central focus of a neurodevelopmental lens and were a central theme of the participant interviews. Often, the experiences of adversity, trauma and abuse occur within the context of a relationship, and therefore, the way children relate to others is altered. This is why the neurodevelopmental lens focuses on building and supporting positive relationships around children and young people. Thomas and Emily summarised this point (Jane and Jocelyn also used almost identical wording to Thomas and Emily):

> *Development happens in relationships. Trauma happens in relationships, but as does the healing components. (Thomas)*

> *Relationship is the way in which change happens or damage is done and then healing can occur. It's in relationship. (Emily)*

What is being referred to here is the notion that children's development cannot be separated from the context within which they live. Therefore, healing must also occur within a context and relationship. Abuse and neglect typically happen at the action (or inaction) of a caregiver. According to the participants, the neurodevelopmental lens draws on attachment theory. Jocelyn described attachment theory: *"Attachment is sort of like the fundamental relationship, you know, between the parent and the child"* (Jocelyn). Through experiences, particularly those that occur within a relationship, children develop relational templates that can influence their responses to future interactions. Jane explained how early experiences impacted the child's attachment and, therefore, the way they process future interactions:

> *I've seen children who have experienced trauma over a period of time have a disposition that interprets hostility and threat. So, that very early trust hasn't been able to... or has been put under threat. So, it is a very close relationship between biology and the way social interactions are processed and received and then put back out and their attempts to connect. (Jane)*

Given that the child's attachment relationships may influence their current relationships, it is, therefore\ important for social workers, according to the participants, to understand the child's experiences and, consequently, relational templates to help them understand the child's behaviour:

> *I think with trauma, I'm looking at it from an attachment perspective. So, when children aren't feeling safe in their attachment, and they don't trust adults, they often have kind of an influx of cortisol, causing stress to their brain. And when they have that repeated exposure to the stress and the cortisol, they often have their fight or flight activated in their brain which allows them… or doesn't allow them to have reached that area of logical thinking. (Amanda)*

Similarly, Charlotte also tried to understand the child's attachment template to understand the child's behaviour:

> *It's helping… I guess, understand you know what their templates, might be like, and so why they're behaving, you know, maybe in that manner. (Charlotte)*

Both Charlotte and Amanda described how they think about the child's early experiences and why they may be behaving in the way they are. For some children, their experiences of relationships have been a source of threat (such as when a caregiver has abused them), and this can result in the forming of protective mechanisms, such as the fight or flight described by Amanda. Amanda integrated her understanding of attachment relationships and how the stress response system operates, demonstrating how the various principles of the neurodevelopmental lens interact.

The focus on relationships not only provided insight into a child's behaviour but guided the participants in how they worked with the child. All participants viewed positive, trusting relationships as protective for children who have experienced adversity. The following two

quotes demonstrate how the participants viewed the importance of ensuring children have supportive, reliable relationships in their lives:

> *Having one person in their life that is… maybe I mean, I've used the word "trusted adult" before – it doesn't necessarily have to be a parent, but somebody who believes in them… It's around having somebody that really does show an interest in them. And it can only… It can sometimes even just be one teacher, or a coach, or a neighbour. (Sheryl)*

> *We know that if there's one really solid, predictable adult in their lives, that makes a huge difference in terms of their attachment and their security. (Rebecca)*

The participants viewed these positive relationships as catalysts for healing and change. The participants' understanding of the importance of relationships influenced their selection and approach to interventions. There was a focus on supporting parents and caregivers to build a positive relationship with the child, as explained by Jocelyn:

> *It's very well saying to people: "Go to a parenting course"… but you actually have to have a relationship with the child. And once you have a relationship with the child, then you can start actually building on sort of strategies. (Joceyln)*

Jocelyn emphasised the importance of relationships as a priority within the neurodevelopmental lens, as other strategies are futile without a relationship. Thomas expanded further on the reasons behind why healing occurs within relationships:

> *It's a fundamental belief and understanding that our brains are designed to develop and operate in a social milieu, social environments. We can't operate independently. And so, once you've kind of got that concept, it's a lot easier to create therapeutic opportunities for these kids because they all, they all happen in relationship to others. (Thomas)*

This quote from Thomas illustrates the overwhelming sentiment from the participants that healing occurs within the context of relationships. Thomas' reference to *"therapeutic opportunities"* is in relation to activities or interventions that have been informed by the neurodevelopmental lens that may be beneficial for the child. These could range from swinging on a swing to more traditional therapy approaches. Thomas' point is that these opportunities should have a relational component wherever possible.

The participants in this study focused on supporting a child to develop relationships which would endure into adulthood. Child protection systems only work with children, so facilitating enduring relationships that will support children through adulthood is seen as important work. Emily, who worked in a support role for foster parents, explained:

> *What I really want for them is to be able to build that trust in relationship with their foster parents because I believe that is the main way in which change is going to happen for them. And for them to be able to build, you know, trust and connection with people who are going to be able to walk with them. You know, lifelong connections. (Emily)*

Emily's narrative focused on supporting children in building enduring relationships that will help them throughout their adult lives. The participants were cognisant of the long-term impact of their work on the children with whom they worked.

In summary, the participants' accounts indicated that relationships are a foundation for a neurodevelopmental lens. Whilst adversity occurs within the context of a relationship, making relationships threatening for children, healing also occurs in the context of relationship. Positive relationships were seen as a protective factor for children, so supporting trusting relationships was a significant focus for the participants. These relationships build a sense of connection and belonging.

Building a sense of connection and belonging

The participants' primary focus was on supporting parent/caregiver relationships with the child. However, they also recognised that a broader sense of connection and belonging was protective. This sense of belonging may come from a variety of sources. Charlotte was asked what factors help a child do well despite their adversity and responded:

> *I think obviously relational health, you know. If they've got really, they've got connection to their community, connection to their teacher, connection to their faith. Because that brings us all down, doesn't it? You know, it helps regulate, so that sense of belonging… But I think, yeah, definitely having a good connection with their teachers, and with their whānau obviously, hmm, and having a big family around them is a good buffer. (Charlotte)*

Rawiri agreed and explained that sometimes children needed to be supported and encouraged in finding a place where they felt they belonged:

> *A lot of it is around attachment and showing our children what is a healthy attachment, what is a healthy relationship, what is belonging, where do you belong, who do you belong to. Is it okay to belong to, like, oh, "I like doing maths, and I've got a maths club". "Cool. Then belong to that maths group". And they're like, "Oh, but everyone thinks they're nerds". So, I'm like, "It doesn't matter what everyone else thinks – it's fine. It's perfectly fine to belong". (Rawiri)*

This sense of belonging and connection comes from several sources; an important source is a connection to one's cultural roots. Several participants (Tania, Emily, Sheryl, Rawiri, and Charlotte) reflected on the importance of connection to culture, particularly for tamariki Māori:

> *With Māori children, we talk about their iwi, and when grounding them, I think, in a way, it's a lot easier if they're connected to that. If they're not connected to their culture, obviously, it's a little bit harder. But they [Māori] have a firm belief of their*

connection to their earth and their connection to their, you know, what came before them all that kind of stuff. So, I think, I mean, if that was encouraged, more and more Māori were connected to their marae and iwi and all the knowledge that comes with that, I think our work would probably be a whole lot easier. Because a lot of that belief follows the same lines of mindfulness, connection, stability, you know, having a place to go back to. Even if you don't have your family around you, you know that you have your marae, your land, your connection to all of that kind of stuff. So, it kind of all intertwines. (Tania)

Here, Tania emphasised the importance of cultural connections and explained how this provided a sense of connection and grounding that is useful for children. Sheryl elaborated in a similar manner, describing how their place of employment supported children to build this sense of connection:

We find out, we talk to the family about what their connections are, about what their beliefs and values are, and try and support those. But particularly for Māori children, if they don't get those connections, our kaumātua [elder] will find out who their… where their whanaunga [relative, kin, blood relative] connections are… We're taking groups of children on trips to marae to introduce them to their whānau… We teach a lot of te ao Māori… so the stories of taniwha [water spirit, monster], atua, and Papatūānuku [Earth mother] and all the things that support grounding are actually told to children as part of their everyday being. We desperately try not to be tokenistic, but it sometimes happens, not because, yeah, it just does happen. (Sheryl)

Sheryl illustrated the importance of helping children (and, at times, families and whānau) feel connected to their culture. For tamariki Māori, this included connecting them to their whenua, whānau, marae, hapū, and iwi. This also involved building an understanding of te ao Māori (Māori worldview), including cultural values, traditions, and knowledge.

The participants clearly articulated the importance of strong, positive relationships for children, and identified strategies for engendering a sense of connection and belonging. The next theme builds on this and discusses the strategies for working collaboratively across a child's systems.

Working collaboratively

Participants described the importance of working collaboratively across the various systems surrounding the child to create a cohesive approach; Thomas (who was trained in the NMT) called this approach the therapeutic web:

> *We need to build in a therapeutic web of support so that we get a consistent plan of attack. Basically, consistent interventions for these kids, regardless of which adult it is that's working with them. (Thomas)*

What Thomas is referring to here is the need to ensure consistency across the various systems around the child. As discussed in the preceding themes, multiple interventions are selected and repeated regularly throughout the day based on the child's needs. The participants indicated that systems needed to be cohesive and integrated to best support children to overcome their experiences of adversity:

> *I just think using the Neurosequential Model in there and being able to, like, bring it to like various hui (meetings). You know, it's like, so, everyone in there understands because otherwise what you get is you get a bunch of people – you may have the occupational therapist going in and doing this; the psychologist going in and doing this; the school... (Charlotte)*

> *Yeah, so on a systems level, I try and help the education setting have a better understanding of where this child is and then some strategies, as the adult to meet with the child, help that child, where they're at, cope. Same with the parent, help them identify what are they parenting out of. (Jane)*

Charlotte and Jane highlighted the need for the various systems surrounding the child to work together to achieve a shared understanding of the child's current functioning and the interventions and approaches needed to support them. Some of the participants considered how supports can mitigate the impacts of adversity through an ecological model, as explained by David:

> *Now, there's a lot of other contributing factors around that, so while that can be just about mother and baby, generally mother and baby being the significant carer, there's also the other supports that are there that can be ameliorating or enhancing – so what other whānau supports are around, etc. So constantly looking at that from quite an ecological sort of model. (David)*

David's broader approach to understanding children and their environment was echoed by Jocelyn, who described it as a *"village style"* (Jocelyn) approach. The participants saw a whānau-centred approach, where the strengths of the wider family are drawn on as being effective. A whānau-centred approach was considered culturally appropriate, enabling positive engagement with whānau and families. David explained that investment into the broader whānau is, therefore, necessary as well:

> *And if only we'd invested in them in the anticipation that they're part of the whānau. So, it is more of a whānau look rather than an individual look. Which, of course, Māori would say, well, why wouldn't you? (David)*

David highlighted that the wider systems surrounding the child should be considered as they ultimately influence the child and can be seen as a source of support as the "village" raises the child. The "village" can work collaboratively together to support children and families experiencing adversity.

The ecological approach identified in this section was also present through the participants' consideration of how structural inequalities impact children and the systems around them, ultimately resulting in increased stress. This leads into the next theme on structural factors.

Structural factors

The participants reflected on how structural factors impact children's development:

> *It can mean that those basics – being warm and being fed and having those needs met, can affect a child's development, obviously affect their health. And poor health can also affect development. Yeah. I'm trying to think what else from a poverty point of view. I mean, I think, you know, it depends how broad you want to think about it. But you know, think [about] a child living in poverty in a society where that's... often got, you know, that huge discrepancy between the children that have and the children that haven't. (Rebecca)*

The participants highlighted that structural inequality resulted in increased stress on parents. Jocelyn stated that the impact of poverty was sometimes overlooked and should be considered as part of a neurodevelopmental lens:

> *You take bits away that are not happening – their housing, they don't have enough food – and it falls over. And so, people are looking at the situation going, what's wrong? Why can't they? (Jocelyn)*

Sheryl agreed:

> *I really believe that sometimes you can't go and address what's happening for a child, until the family's stable... If I'm living in somebody's garage with, you know, six people or 10 people in a two-bedroom house, then the last thing I'm going to be thinking about is Johnny. I'm just trying to survive... I mean, you can work with Johnny differently, and we can start developing some understanding around what's*

happening, but to actually have that being reinforced in their world forever, it needs to happen within their home. (Sheryl)

Jocelyn and Sheryl stated that addressing the challenges caused by inequality was essential to creating a sense of safety and stability. Other factors also had an impact on children and families; for example, the participants indicated that being from diverse cultural backgrounds could also have an impact on a child and their family's sense of safety and result in increased stress levels. Jane explained this:

It can create stress, and threat, and disconnect, and hostility within a whole community. It can create un-safety... It's one of the impacts of harm on a whole community-wide level, and then it's stress, isn't it? It places stress on what can actually enable connection and belonging to a place. (Jane)

Jane noted that the impact of being from a diverse cultural background can result in increased stress and a decreased sense of connection and belonging, two core considerations in the neurodevelopmental lens. The marginalisation experienced is reinforced through broader structural issues, such as the impact of colonisation. Colonisation has impacted families and resulted in intergenerational trauma being passed on down through generations:

For our Māori clients, it's difficult. A lot of our Māori clients, like we talked about earlier, come from that intergenerational, systematic trauma lens. (Rawiri)

We talk about intergenerational trauma. And we also talk about the trauma experienced by cultural groups, you know, through colonisation, through, you know, just like the destruction. And the importance of culture in terms of being a connection to culture as being extremely important and a factor in health, you know, in good health. (Emily)

Rawiri and Emily reflected on the ongoing impact of intergenerational trauma and colonisation on families which impact the sense of belonging, connection, and well-being of children and young people. The participants indicated that considering the impact of these broader structural issues was essential to a neurodevelopmental lens. In Aotearoa New Zealand, these impacts were viewed by the participants as particularly impacting Māori through the separation of whakapapa connections and the ongoing impact of colonisation. Amanda stated:

> *Being part of an ethnic minority that is largely going to affect children's identity, whether or not they… how they are perceived in society, and how they identify within their whānau and their wider whānau. So, if they have those ties, I'm thinking, as far as Māori, you know, if we're looking at Māori as an ethnic minority per se, with colonisation and how family are often separated from their roots and from their native land, those whakapapa ties are going to be not as strong, which affects the child's sense of who they are, essentially. (Amanda)*

The ongoing impact of colonisation has resulted in the disconnection from land and identity for Māori. As was discussed previously in the building a sense of connection and belonging subsection, supporting children and young people to reconnect with their culture and build a sense of connection and belonging was seen as being important to help overcome this form of adversity.

Now that the key themes relating to a neurodevelopmental lens and social work practice have been presented, the final theme outlining the advantages and challenges of a neurodevelopmental lens is explored.

Advantages and challenges of a neurodevelopmental lens

Advantages of the lens

Despite the variation in levels of exposure to and training in a neurodevelopmental lens, the participants articulated similar principles of a neurodevelopmental lens. Their accounts indicated that the neurodevelopmental lens provided a useful perspective for understanding and addressing the impacts of childhood adversity.

The participants acknowledged that the brain and its functioning are extremely complex, however, the neurodevelopmental lens provided an understanding of key principles of brain development that made the complexity simpler for social workers to understand. This, in turn, resulted in immediate and practical application to their practice. Thomas explained:

> *Going back to how simple it is at its core is definitely a strength. You can get lots of individual pieces, and as soon as you offer it to people, their eyes kind of light up, and they connect with it, and then they can relate to it. And I think the other piece is, you can apply it straight away, and it has immediate effect. So, as soon as you understand that concept of the effect of stress, stress on the brain, how you then relate to a foster child, for example, automatically changes. (Thomas)*

Thomas' comments demonstrate that a neurodevelopmental lens provides a useful framework through which the impacts of childhood adversity can be understood and addressed. The participants indicated that the approach deepened their practice and resulted in a holistic approach to working with the child and their family:

> *I think it's actually supported a deeper understanding of what's actually happening behaviourally, emotionally, psychosocial dynamics for children which are referred to our service. It also has informed how you look at the way the child is attached to the parent, the environment that they're living in... So, it's become a very, I hate the*

word holistic, but it has become a far more holistic way of working within the child's family structure. (Sheryl)

This deeper understanding of the child results in a greater ability to understand what is happening for the child and, therefore, how best to support them to overcome their experiences of adversity. Sheryl added: *"You're going to spend time really getting to know that child within the structure of their family before you can decide what you're going to do with them"* (Sheryl). Here, Sheryl highlights the importance of developing personalised and individualised plans for the child.

The next section briefly discusses the participants' views on the challenges of using a neurodevelopmental lens in child protection social work practice.

Challenges of the lens

Whilst the lens resulted in individualised plans that considered the developmental, rather than the chronological age of the child, not all services or interventions adopted the same approach. For example, certain programmes or activities would be based on the child's chronological age, when a child may not be operating at that level and require a service that is targeted for a chronologically younger age. Tania said: *"If you've got a child that's 12, but developmentally they are nine, they've still got to fit in the 12-year-old group because they're that size... So, it does make it a little bit trickier"* (Tania). Tania highlighted a challenge with finding developmentally appropriate services for children when services may have specified entry criteria (such as age restrictions).

The participants also stated that when other professionals did not utilise a neurodevelopmental lens in their work, there may be conflict and disagreement about assessment and intervention plans. Amanda remarked: *"There's a lot of people who don't*

understand it quite yet" (Amanda). Emily described an example of this conflict between professional approaches:

> *I'm just thinking, particularly around some challenges, some teachers and some schools, how they might like tradition, you know, just want to employ their traditional approaches to difficult behaviour and, you know, that we know that's not going to be helpful and it's only going to serve to escalate the situation. (Emily)*

Seven of the 11 participants expressed frustration when other professional disciplines focused on diagnosis (typically ADHD). The participants felt the impacts of childhood adversity on functioning were not fully considered:

> *Children with trauma present similarly to children with ADHD in that they have difficulty focusing on a set task. That difficulty focusing is often due to a child, scanning their environment. (Amanda)*

> *As much as we know about trauma and we know about all that stuff that impacts the brain, to have a conversation with a psychiatrist around why you think it's more trauma based rather than ADHD based is a very hard conversation to have. And even with some of the paediatricians, you know they're still medically trained and informed, so having a conversation with them about trauma and how that's impacting these children. And should we be doing more work around the family, around that kind of stuff, rather than medicating children? (Tania)*

The challenge for the participants was that differing disciplines have differing perspectives on the causes of functioning and behaviour. When the participants applied a neurodevelopmental lens, they viewed hyperarousal and challenges with concentrating alongside a history of adversity as being a stress response reaction, whereas other disciplines may make a diagnosis of ADHD. The social workers carefully navigated this space to ensure that children were not pathologised or unnecessarily medicated, whilst still accepting this was not their area of

expertise. This challenge was often amplified as the participants explained that parents often accepted a diagnosis of ADHD and may not understand that adversity can present similarly.

The conflict in approaches was not just between different disciplines but, at times, was found within the same organisation. Some participants felt that organisational culture meant that they were not always supported to operate from a neurodevelopmental lens perspective. Tania explained that unless there was organisational support and enablers to practice from a neurodevelopmental lens, the approach may not be fully embedded into practice:

> *So, even though you come back and you're like, this all makes sense, and we need to put this into practice. If every tool you have, every intervention template… if it's [the neurodevelopmental lens] not in that, then as much as you've got that knowledge, if you can't find a place, and when you're writing up your Family Group Conference referral, if it's not in there, then it doesn't embed. (Tania)*

The participants spoke about the busy and demanding nature of child protection social work and, as Tania highlighted, unless social workers are supported to fully embed the approach, it would become lost in the busyness. Tania commented on the organisational challenges as impacting on their ability to utilise a neurodevelopmental lens: *"The normal ones, you know, politics, money, KPIs [Key Performance Indicators], low staff. You know, all the things that impact all of us on a daily basis"* (Tania). Thomas also agreed that the lens could be *"quite a time and resource intense approach"* (Thomas) but also said they viewed the strengths of the lens as being: *"It doesn't have to cost a lot of money at kind of that individual intervention level, you can do just really simple stuff, without costing money that you can apply straight away, as a caregiver, and as a social worker"* (Thomas). Thomas' apparent conflicting views on the resource intensiveness of the lens may suggest there are greater demands on social workers' time when using the neurodevelopmental lens, although interventions can draw on simple activities (such as swinging and kapa haka). These challenges can be overcome by

organisational support for the use of the neurodevelopmental lens as alluded to by Tania and Thomas.

Chapter summary

The findings highlighted how a neurodevelopmental lens can be used in child protection social work to understand and address the impacts of childhood adversity. In their interviews, the participants described the key elements of a neurodevelopmental lens and how they used them to structure their thinking, build an understanding of the impacts of childhood adversity, and plan and implement/facilitate interventions. The neurodevelopmental lens principle of the sequential nature of brain development was evident in the interviews and helped participants understand how adversity early in life impacts development. The sequential nature of brain development informed how social workers approach interventions as lower networks will be targeted first. Related to this was the role experiences play in development. The participants also spoke about the role of the stress response system and how children who have experienced childhood adversity often have difficulties regulating their emotions. Patterned, repetitive, rhythmic, and somatosensory activities were used by the participants to help children self-regulate and eventually build a greater capacity in this area. The participants identified that establishing positive relationships and a sense of connection and belonging for children and young people was also an important theme found in this study. It is through relationships that development happens, and therefore, healthy relational interactions are essential for healing. The participants discussed collaborative approaches to working with the child and their surrounding systems. Broader structural factors, such as poverty and being from a diverse cultural background, were discussed. The participants viewed whānau-centred approaches as important to ensure holistic well-being for the child and their family. Lastly, the advantages and challenges of using a neurodevelopmental lens in practice were highlighted. The next chapter situates the findings within the literature.

Chapter Six: Discussion

This research explored how child protection social workers understood and addressed adversity, utilising a neurodevelopmental lens within their practice. Chapter One outlined the four key research questions the study sought to answer:

1. What principles do child protection social workers view as being important to the neurodevelopmental lens?
2. How do child protection social workers use the principles of the neurodevelopment lens to understand the impact of childhood adversity on their clients?
3. How do child protection social workers use the principles of the lens to inform intervention planning?
4. How could a model based on a neurodevelopmental lens be utilised in the Aotearoa New Zealand context?

This chapter examines the findings (the key informant interview findings were presented in Chapter Four and the social worker participant findings in Chapter Five) and answers the first three research questions. A model (Research Question Four) based on the neurodevelopmental lens (this is discussed further in the conclusion chapter) is presented. Drawing on practice-research methodologies, the research explores how child protection social workers use the neurodevelopmental lens to understand the impacts of childhood adversity and how it informs intervention planning. An ecological-transactional perspective was utilised as the theoretical framework and informed the analysis of the findings (see Chapter Two). This enabled the consideration of the multiple levels of the ecological system, including structural factors alongside individual factors, which aligns with the principles of the profession of social work (IFSW & IASSW, 2014).

This chapter utilises the ecological-transactional perspective to structure the chapter. The chapter begins with a discussion of the individual level, followed by the microsystem. Next,

the mesosystem is discussed, and finally, the exosystem, macrosystem, and structural adversity are discussed. The chapter discusses under each level of the ecological system the relevant themes found in the data and argues that the themes could be used to expand the existing neurodevelopmental lens principles.

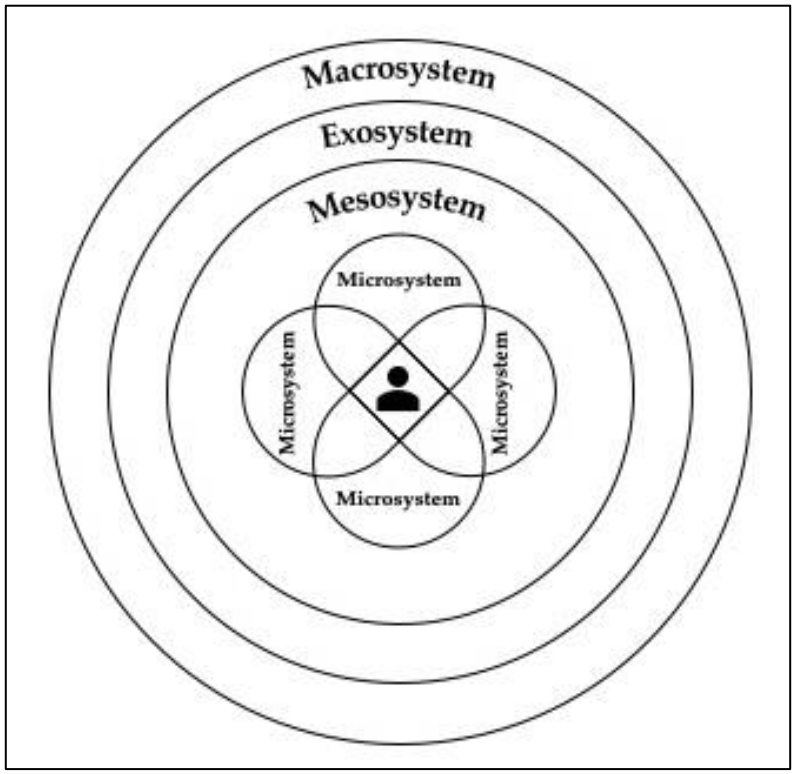
Ecological-transactional perspective

The ecological-transactional perspective (see Chapter Two) is used as the theoretical framework within this chapter and guides the structure of this discussion (Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019). Figure 7 (next page) is a graphical illustration of the ecological model. The individual is located within the centre. Surrounding the individual are the various microsystems which are the immediate environments a child engages with (for example, home and school). The mesosystem is the linkage between two or more microsystems (for example, the interactions between a child's school and parents). Moving further out, the exosystem compromises the individual's broader community within which the individual exists but with which the individual does not interact (i.e., a parent's interactions with their workplace). Finally, the furthest system from the individual is the macrosystem; which is includes societal structures and culture.

The remainder of this chapter is structured utilising the system levels of the ecological-transactional perspective. The discussion starts with the individual and then moves outwards, ending with the macrosystem.

Figure 7

Ecological-transactional perspective



Note: Adapted from Harms and Connolly (2019).

The individual level

In this research, two extant neurodevelopmental lens principles (experiences shape development and sequential development and intervention) were identified (Research Question One) within the participant narratives. The study also found the theme of the stress response system was important to the participants and is found within the existing neurodevelopmental literature. This section will argue that the stress response system should be included as an additional principle for child protection social workers using a neurodevelopmental lens. The principles were used by child protection social workers to understand the impacts of adversity (Research Question Two) and to inform their intervention planning (Research Question Three).

Understanding the impacts of adversity on the individual

The themes of brain development and the influence of experiences on development found within the participants' narratives align closely with the extant neurodevelopmental lens' principles of experiences shape development and sequential development. The participants appeared to use these principles to support their understanding of the impacts of adversity on the individual. The participants selected interventions in a sequential manner, choosing interventions in an order which reflected the development of the brain.

The principle of experience shapes development is important to child protection social workers and can be summarised as:

> **Experience shapes development**
>
> Experiences influence the development of the brain. The brain is malleable and can be changed through experiences.

The principle of experiences shapes development suggests experiences such as adversity can have negative impacts on development (Belsky & de Haan, 2011; Perry, 2001, 2006, 2009; Twardosz & Lutzker, 2010). A child who has experienced adversity is likely to have delays in a variety of functioning areas (Becker-Weidman, 2009; Cook et al., 2005; Lima et al., 2023). As discussed in Chapter Four, Perry (2009) described this as "use-dependent modification" (Perry, 2009, p. 243). Use-dependent modification suggests adverse experiences can result in disruptions in the development of the brain, which can lead to compromised functioning, such as an overly reactive stress response system (Perry, 2001, 2002, 2008, 2009). Every child has a different combination of experiences, and adversity occurs at different times in their developmental trajectory, therefore, explaining why adversity affects every child in a different manner. This understanding aligns with the ecological-transactional perspective which posits that protective and risk factors at various levels of the individual's ecological system interact together to influence an individual's development (Cicchetti & Valentino, 2006; MacKenzie et

al., 2011; Polak & Saini, 2019). Risk and protective factors are either enduring or transient (i.e., they come and go), meaning a person's experiences (both protective and adverse) are likely to impact their development. This finding is significant as it reminds social workers to consider the impact of experiences on a child's development; it provides insight into how social workers think about a child's functioning when they have experienced adversity and orients them towards a holistic understanding of the impacts of adversity.

Understanding a child's history of adversity and protective factors is central to the theoretical descriptions of the use of the neurodevelopmental lens and can support how social workers understand the impacts of adversity (Mason et al., 2020; Perry, 2020; Perry & Dobson, 2013). Through considering the intersection and timing of previous protective and adverse experiences (across the multiple levels of the ecological system) and their impact on the developing regions of the brain, insights into the reasons behind the child's behaviour and functioning were apparent to the participants in this study. Jane, Sheryl, and Thomas spoke about how the impacts of adversity can mean children are not at the same level as their peers. It is important to consider where the child is at developmentally rather than their chronological age. The participants communicated and discussed this with others working with the child (for example, family, foster parents, and teachers). Building understanding and having developmentally appropriate expectations was found in this study to result in people having more empathetic responses to children as they could understand the possible reasons behind a child's behaviour and responses, a finding reinforced in other studies exploring the use of the NMT model in practice (Caplis, 2014; Mason et al., 2020).

The principle of sequential brain development builds on this principle by suggesting the timing of adversity may explain the diverse range of impacts, and can be summarised as:

Sequential development and intervention

Development occurs in a sequential manner with functions originating in lower regions of the brain developing before functions largely controlled by higher areas of the brain. Interventions should also be adopted in a sequential manner, addressing lower regions before higher regions using the heuristic safety, regulate, relate, reason.

The principle of sequential development was found to be important to child protection social workers using the neurodevelopmental lens. As outlined in Chapter Four, the principle is: functions originating in lower regions of the brain (such as temperature regulation, heart rate, and breathing) develop before functions originating in higher, cortical regions of the brain (such as abstract thought and speech and language; Belsky & de Haan, 2011; Perry, 2002, 2006; Perry, 2009). The brain does not physically develop from the bottom to the top. Instead, almost all regions of the entire brain undergo changes throughout a person's lifetime (particularly so during childhood and adolescence; Perry, 2002, 2006, 2008, 2009). The interconnected nature of the brain means that various regions of the brain are often involved in different functions (Perry, 2001, 2009). Therefore, disruptions in development due to adversity can affect multiple brain regions and functions. The principle provides insight into how experiences of adversity may impact differently on individuals. Furthermore, the principle can be used to inform intervention planning through providing a framework through which the sequence of interventions can be selected.

Adversity is believed to affect the regions of the brain which are being rapidly organised at the time (Perry, 2006, 2008, 2009). The point in time when adversity occurs may explain the diverse range of impacts of adversity. Consistent with the literature, the participants explained that the timing of adversity is important as it may affect the regions of the brain that are developing at that point in time. For example, the stress response system is being developed

during the first few years of life and adversity may have a greater impact on the stress response system if experienced whilst it is developing.

Whilst it is not possible to determine the exact impact experiences had (or may have) on development, the principles of sequential development and experience shapes development can be used to holistically examine the child's current development and functioning. Within the NMT approach, practitioners score children's history of adversity, relational health, and functioning in a number of domains, providing insight (and visual representation) into areas of functioning where the child is below age-expected levels (Perry, 2020; Perry & Dobson, 2013). This study extends the neurodevelopmental lens through the articulation of how social workers who utilised a neurodevelopmental lens in practice considered where the child may be at developmentally rather than chronologically. This helped them to identify developmentally appropriate expectations (for example, providing only one instruction at a time if the child had not yet developed the ability to retain more than one instruction) and understand that chronological expectations may not be achievable for the child given their current functioning and behaviour.

Whilst the key informants and participants did not suggest that a specific experience led to a specific outcome, they supported those working with the child to understand a child's history. Understanding the child's history can result in a greater appreciation for why the child may be responding/behaving in a certain way, resulting in a more empathetic response to the child. By explaining a child's history of experiences, possible reasons behind the behaviour become possible. For example, key informant Anna shared that this shifted the focus from the child being difficult or oppositional to building an understanding with foster parents (and others working with the child) about how the child's experiences result in certain responses. Reframing behaviour to being an appropriate and understandable response to the child's experiences of adversity can result in a more empathetic response to the child's behaviour and emotional dysregulation (Mackenzie & Roberts, 2017). As a result, the response to the child

may shift from punishment to one of supporting the child to feel safe and to regulate their emotions. This aligns with a response-based practice approach whereby a child's actions are an active response to try and keep themselves safe when they feel unsafe (Carriere & Richardson, 2013; Richardson & Bonnah, 2015). Understanding the child's history, the impacts on development, and their responses to feeling unsafe through the principle of sequential development is key to achieving these empathetic responses. This finding builds on the neurodevelopmental lens knowledge and practice by describing how social workers support those around the child who care for the child.

Closely related to the impacts of adversity on the individual is how the individual responds to stress. This is discussed further in the next section.

Understanding responses to stress

The participants understood that one of the impacts of adversity was changes in the way in which the child responds to stress. The stress response system is not currently a named principle of the neurodevelopmental lens but is a recurring theme in the neurodevelopmental lens literature (as discussed in Chapter Four). The findings of this study suggest that child protection social workers frequently considered the stress response system and how they could support children to feel safe and regulated. Therefore, the findings of this study suggest a new principle relating to the stress response system could be introduced as this is an important way in which the participants understood the impacts of adversity and planned interventions. The proposed principle of the stress response system and regulation (a discussion on regulation is included in the subsection below on planning interventions) can be summarised as:

The stress response system and regulation

The stress response system assesses incoming sensory information for possible threats and activates an all of body response to perceived threats. The stress response system uses a variety of strategies (such as fight, flight, or freeze) to keep a person safe.

The ability to regulate is returning to a state of calm and is important for daily functioning. Achieving regulation can be supported by somatosensory, rhythmic, patterned, repetitive activities.

The principle of the stress response system (see Chapter Four) closely relates to the previously presented principles of sequential brain development and experiences as our developmental experiences also influence the stress response system. The stress response system is a key system of the brain which responds to experiences of adversity. Information from our senses and body enters the brain and is quickly processed for meaning in the lower regions of the brain (see Chapter Four for a fuller discussion of the stress response system; Perry, 2001, 2009; Porges, 2011). If the incoming sensory information is novel (new) or assessed as being a perceived threat, the brain activates the stress response system. The stress response system is a complex network of systems and regions of the brain and body, designed to enable a quick response to possible threats to keep us safe using a variety of strategies (Griffiths & Hunter, 2014; McEwen, 2006; Perry, 2001, 2006, 2009; Porges, 2011; Wilson et al., 2011). The principle provides child protection social workers with an understanding of how a child's stress response system may be altered following adversity and how they may respond to situations which they perceive to be stressful.

Understanding responses to stress is important to the neurodevelopmental lens as it can provide insight into a person's behaviour and responses to situations (Perry, 2006, 2008, 2009). Responses to stress were grouped into three main categories by the participants: fight, flight, and freeze. These different responses can be summarised as:

- **Fight** – behaviours which are interpreted as aggressive. For example, arguing, destroying property, physical violence, and swearin
- **Flight** – leaving the situation to avoid threats. For example, running away or hiding; and
- **Freeze** – a dissociative response where the person withdraws into themselves to avoid feelings of pain. For example, being very quiet, daydreaming, and feeling numb (Jiang et al., 2019; McEwen, 2006; Perry et al., 1995).

The key informants and participants understood these responses to be adaptive mechanisms designed to keep children safe. However, children who have experienced adversity can have an overactive stress response system, resulting in a much greater response to possible threats; they can also misinterpret their environment as potentially threatening, resulting in the misactivation of their stress response system.

In this current research, the key informants and participants identified that the stress response system is a vital protection mechanism designed to protect people from potential threats, including adversity. Through repeated or prolonged activations of the stress response system, experiences of adversity were posited by some of the participants and aligned with existing knowledge, to generate greater sensitivity to threats, resulting in a maladaptive stress response system (Beeghly et al., 2016; McEwen, 2006; McEwen & Gianaros, 2011; Misiak et al., 2022; Perry, 2001, 2009; Perry et al., 1995; Ungar & Perry, 2012). Several participants (Jane, Amanda, and Sheryl) spoke about how children who have a history of adversity can misinterpret cues from others (for example, safe touch or being cared for) resulting in disproportionate responses to the perceived threat. This study found that the neurodevelopmental lens provided social workers with an understanding of the stress response system and the possible impacts experiences of adversity may have on development. This understanding can help contextualise behaviours through the identification and framing of behaviour as being a response to perceived threats driven by the stress response system.

Understanding a child's behaviour as being an understandable response to stress can result in more empathetic responses to the child. The participants used their knowledge, from the neurodevelopmental lens, of the development of the stress response system to understand a child's behaviour and to educate others about this; a finding supported by the literature (Caplis, 2014; Mason et al., 2020). Through considering if the child's stress response system is activated, therefore, driving the behavioural and emotional response, those working with the child may be able to reframe the behaviour as being a response to stress (Mackenzie & Roberts, 2017). Psychoeducation about the possible reasons behind a child's behaviour is important as it can support understanding and normalisation of children's behaviour as being a maladaptive stress response to perceived threats as a result of their history of adversity (Caplis, 2014; Mason et al., 2020). This may result in a different approach to engaging with the child and supporting the adult to remain calm and present in the moment (Caplis, 2014; Mackenzie & Roberts, 2017; Mason et al., 2020). This finding builds an understanding of the important role social workers have in supporting empathetic responses to a child's behaviour through providing psychoeducation and support to those working with the child to contextualise and understand the possible reasons behind a child's behaviour.

The next section builds on the understanding of the impacts of adversity on the individual to explore interventions using the neurodevelopmental lens.

Planning interventions

At the individual level, two key principles of the neurodevelopmental lens informed the intervention planning of child protection social workers. Firstly, the principle of experience shapes development provided a foundation for interventions as experiences become the key manner through which healing can occur. Secondly, the principle of sequential development and intervention established a framework through which interventions are selected in a sequential manner reflecting the order of brain development. These two principles (discussed

above and in Chapter Four) and how they support the planning of interventions are now discussed.

Experiences are a foundation for intervention

The ability of experiences to shape and influence human development provides a foundation for the intervention philosophy of the neurodevelopmental lens. The participants reported that changes to the brain's functioning could be achieved through repeated experiences, which provided them with hope for change and healing. The concept of brain plasticity (the ability of the brain to change) is a central component of the knowledge and practice of the neurodevelopmental lens (Perry, 2006, 2008, 2009, 2020; Perry & Dobson, 2013). Repetitive activation of neural networks which occurs through experiences can change the brain's functioning and improve functioning (Farmer, 2009; Kleim & Jones, 2008; Perry, 2006, 2008, 2009, 2020; Perry & Dobson, 2013). Changes in development as the result of experiences are supported by the ecological-transactional perspective. The ecological-transactional perspective (Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019) posits that change is possible through increasing the number of protective factors and reducing risk factors (at each level of the ecological system). Changes in functioning can be achieved through providing experiences (or interactions with the ecological systems).

The neurodevelopmental lens' principle of experience shapes development suggests experiences which support healing (these are discussed further in the next section) need to be repeated regularly at a sufficient rate to support changes (Kleim & Jones, 2008; Perry, 2006, 2008, 2009, 2020; Perry & Dobson, 2013). Put simply, change occurs when neural networks are activated in a patterned, repetitive manner (Perry, 2006, 2008, 2009, 2020; Perry & Dobson, 2013). The frequent repetition proposed by the neurodevelopmental lens, and found in this study, is different to other traditional notions of therapeutic interventions (such as talking therapy) which often occur once a week. Infrequent repetition (i.e., once a week) of 'therapeutic' experiences makes it more difficult to bring about meaningful change. Instead,

frequent repetition of experiences throughout a child's week is important to healing, creating many opportunities for change to occur. Through awareness of the role experiences play in addressing the impacts of adversity, this study emphasised the important role of social workers in supporting children to have experiences which may support their healing. This principle closely relates to the other principles of the neurodevelopmental lens as the activities and interventions chosen are informed through these principles. For example, a social worker may work with a child's therapeutic web (discussed further under the creating a therapeutic web section) to create a plan for the child which includes a range of regulation activities based on the child's culture, occurs in a safe environment, and happens with other children to support the child's relationships. This study provided an important insight into how social workers applied their knowledge of the neurodevelopmental lens' principle of experiences shapes development to create a plan for a child which involves repeated experiences that address the developmental needs of the child.

The next section discusses how child protection social workers selected developmentally appropriate interventions using the neurodevelopmental lens principle of sequential development and intervention.

The engagement and intervention sequence

The principle of sequential development informs the selection of interventions and provides an approach to engaging with children. Interventions that are informed by a neurodevelopmental lens involve the intentional inclusion of developmentally appropriate activities into the day-to-day life of a child (Perry, 2020; Perry & Dobson, 2013). A wide range of activities (for example, swinging on swings and rocking on rocking chairs or hammocks, kapa haka, drinking smoothies, massage, and weighted blankets) were suggested by the key informants and participants as interventions to address the multi-faceted impacts of adversity. Different activities are selected to address different impacts on functioning (a point discussed further below). The principle of sequential development informed the order of interventions.

The participants described selecting interventions targeting the lowest regions of the brain before those targeting higher regions of the brain. Thomas and Amanda described the importance of working on self-regulation for a child (functionally originating in the lower region of the brain) before higher-cortical functions such as cognitive tasks (including relationships, abstract problem solving, and cognitive reasoning; Perry, 2020; Perry & Dobson, 2013). For example, academic learning requires children to have some ability to self-regulate their emotions and focus on learning (DePrince et al., 2009; Perry, 2020). Children who have experienced adversity can have difficulties and delays with self-regulation and sustained attention on tasks, which may contribute to lower academic performance levels (DePrince et al., 2009; Perry, 2020). Therefore, focusing on pre-cursor, lower functions before higher functions of the brain is important in addressing the impacts of adversity. This principle provided guidance for the most appropriate approach to the selection of interventions, a point which is discussed further in the next section.

The sequence of engagement and intervention can be summarised through the heuristic *regulate, relate, and then reason* referred to by several of the key informants and participants, with the heuristic being accredited to Dr Bruce Perry (as discussed in Chapter Four; Greer, 2015, 2021; Ryan et al., 2017). In describing this heuristic, the participants explained how it informed their sequencing of interventions in a bottom-up manner, with a focus on safety and regulation, followed by relationships, before cortically heavy interventions such as talking therapies (reasoning). A bottom-up approach refers to the way in which the brain develops (sequentially from the bottom-up) and processes information (Greer, 2015, 2021; Perry, 2008, 2009, 2020; Perry & Dobson, 2013). Experiences are processed through the senses. Sensory information enters and is processed in the lower regions of the brain first, before being passed up to higher regions (Perry, 2008, 2009, 2020; Perry & Dobson, 2013).

The sequential approach is important as it reflects the neurodevelopmental lens' principle of sequential development of the brain with lower functions of the brain needing to be developed

for higher functions to be effective (Perry, 2008, 2009, 2020). The heuristic has previously been adapted within the Aotearoa New Zealand context (Greer, 2015, 2021). Greer (2021) adapted it to *recognise, responsive, regulate, relate, reason, restoration* as practice prompts for a trauma responsive care model for children in supervised group homes. Greer's adaptation appears to draw on the principles of *recognise, respond, regulate, restore* from the TIP approach developed by Oranga Tamariki (2018). The inclusion of recognise, respond, and restore within these practice frameworks is to prompt practitioners working with children who have experienced adversity to identify and respond appropriately to trauma, with the outcomes sought being restoration of well-being (Greer, 2015, 2021; Oranga Tamariki, 2018). Whilst the findings of this study support the inclusion of regulate, relate, and reason, the additional prompts of recognise, respond, and restore were not found within this research. There are several possible explanations for this. Firstly, the heuristic's original intention was as a reminder for practitioners of the neurodevelopmental lens' sequence of interventions; recognise, respond, and restore do not necessarily align with this intended purpose. Secondly, the neurodevelopmental lens' focus is already on identifying, understanding, and addressing the impacts of adversity with the goal of restoring well-being so the words recognise, respond, and restore may be superfluous. Furthermore, the participants in this study may not have been aware of these frameworks.

This study recommends that the heuristic should be adapted to ***safety****, regulate, relate, reason*. This adaptation is recommended as analysis of the key informants' and participants' narratives in this research suggested that safety is a precursor to and needs to occur before regulation. Tania, Charlotte, Sheryl, and Thomas spoke about creating a sense of safety and were clear that this needed to occur before a focus on regulation or relationship. The absence of a sense of safety can lead to activation of the stress response system or dysregulation (Greer, 2015, 2021). The neurodevelopmental lens and the NMT (which is informed by the lens) categorises the brain into four overarching domains of functions (see Table 6 below) and relates these to the primary region of the brain these are controlled by: sensory integration

(brainstem), self-regulation (diencephalon), relational (limbic), and cognitive (cortex; Perry, 2008; Perry, 2009, 2020; Perry & Dobson, 2013). Each of these functions and regions of the brain are also associated with a component of the heuristic to which it predominantly relates. For example, the limbic system is largely associated with relationships and responds to relational interventions. The discussion will now turn to exploring each area of the adaptive heuristic (safety, regulate, relate, and reason) in turn, starting with a discussion on creating a sense of safety.

Table 6

Areas of the brain and how they relate to the neurodevelopmental lens heuristic and domains of functioning

Area of the brain	**Heuristic**	**Domains of functioning**
Brainstem	Safety	Sensory integration
Diencephalon/mid-brain	Regulate	Self-regulation
Limbic	Relate	Relational
Cortex	Reason	Cognitive

Safety

A sense of safety is important as an individual may become dysregulated (through over-activation of their stress response system) if there is a perceived or actual threat to their safety (as discussed in Chapter Four). Participants stated that creating a sense of safety was distinct from regulation. If someone does not feel safe, their stress response system may be activated, and they potentially could become dysregulated. Inversely, if the stress response system is activated, a person will only be able to return to a sense of calm after the threat is no longer present and they feel safe. Charlotte linked a sense of safety to the neural networks originating in the brainstem. The brainstem controls important functions for survival (such as heart rate, blood pressure, and breathing) and is involved in assessing incoming sensory information for threats to safety (Greer, 2015, 2021; Perry, 2008, 2009, 2020; Perry & Dobson, 2013). This study extends the neurodevelopmental lens literature by adapting the heuristic so that a sense of safety occurs before regulation. This adaptation is important as children who have experienced adversity often have a history of (and may continue) feeling and being unsafe.

Addressing the child's safety needs was found in this research to be of importance to child protection social workers. Child protection social work has a focus on risk and safety (Keddell, 2014; Turnell & Edwards, 1999), which may explain the importance placed on safety within this study. This study identified two main ways within which child protection social workers supported the creation of a sense of safety: through predictable, stable environments, and through ensuring a child's needs are met by drawing on Maslow's hierarchy of needs.

The participants sought to create stability for the child through predictable and consistent routines, structure, and environments, a finding supported by a systematic review of the literature (Zabern & Bouteyre, 2018). By doing so, the participants felt children knew what to expect and this created a sense of control for the child. The participants sought to introduce the child to new people prior to transitions (for example, moving placements) which added to a child's sense of control. Several techniques were described when introducing a child to new

caregivers, such as the new caregivers having video calls with the child and showing the child pictures of their new home. These contributed to a sense of familiarity which was believed to create a sense of safety and security. The importance of relational stability will be discussed further in the building connection and belonging section below. This finding is an important contribution to the knowledge and practice of the neurodevelopmental lens as it identifies the strategies social workers can use to build a sense of safety by creating predictable and familiar environments.

Key informant Mere and several participants in this study referenced Maslow's (1943) hierarchy of needs as a framework through which they considered safety needs and reiterated that meeting these needs was the priority. The hierarchy consists of five needs, which are theorised as sequentially needing to be met, with lower needs requiring to be met before higher needs can be met. The needs (from the bottom up) were physiological (food, water, sleep), safety (resources, health, secure environment), belongingness (love, friendship, family), esteem (confidence, self-esteem, achievement), and self-actualisation (morality, creativity, problem-solving). The hierarchy of needs aligns with the adapted neurodevelopmental lens heuristic of sequential development and the NMT domains of functioning as illustrated in Table 7. Esteem and self-actualisation are combined in Maslow's hierarchy as these both require complex cognitive skills, aligning them with the cognitive and reasoning levels of the model and heuristic respectively. These similarities and the sequential nature of the frameworks may explain why the participants referenced Maslow's hierarchy. This study highlights that safety should be considered in a multi-dimensional manner with safety being conceptualised as much broader than immediate safety when considered through Maslow's hierarchy of needs.

Table 7

A comparison between the neurodevelopmental lens heuristic and Maslow's hierarchy of needs

Neurodevelopmental lens		**Maslow**
NMT domains of functioning	**Adapted Heuristic**	**Hierarchy of needs**
Sensory integration Self-regulation	Safety Regulate	Physiological Safety
Relational	Relate	Belongingness
Cognitive	Reason	Esteem Self-actualisation

Maslow's hierarchy of needs has been criticised as being particularly problematic for Indigenous populations and other cultural groups as it reflects a Eurocentric paradigm which places individual needs over collective well-being (Bear Chief - Oom Kapisi et al., 2022). Key informant Mere explained that Māori are a collective people and are unwell when they are not connected, aligning with the critique of Maslow's hierarchy by Bear Chief - Oom Kapisi et al. (2022). Mere also referenced Maslow's hierarchy of needs and described the importance of creating a sense of safety for individuals. This may be explained through applying a collective lens. A sense of safety can be considered across various systems, such as the collective safety needs for the whole family and school classroom. Once a sense of safety is established, the focus shifts to supporting the child to become regulated.

Regulate

The second level of the heuristic, regulate, was found to be an important priority and is connected to safety. The participants' accounts indicated that when someone feels unsafe, their stress response system is activated, and this may lead to emotional dysregulation.

Regulation is a person's ability to manage their emotional, cognitive, and behavioural responses to stimuli, including supporting a return to a calm state after their stress response system has become activated due to a perceived or actual threat to their safety (Eisenberg et al., 2010; Perry, 2008, 2009, 2020; Perry & Dobson, 2013). If threats to safety are persistent, regulation becomes difficult. Stressors occur throughout everyday life and the activation of the stress response system is a natural, protective response to keep people safe from possible dangers. Being able to appropriately respond to potential threats and regulate is an important competency. In this study, the participants emphasised that the development of a child's self-regulation was an important area of focus for their practice when utilising a neurodevelopmental lens.

The stress response system develops and can be changed through repeated experiences that support regulation (as discussed in Chapter Four). The key informants and participants indicated that many different activities and approaches may support someone to become regulated or improve their self-regulation abilities. Within this research, the key informants and participants described activities that reflected the approach described in the theoretical literature of the neurodevelopmental lens (examples of these are included in Table 8 on the next page). These involve somatosensory, patterned, repetitive, and rhythmic components. These sorts of activities are believed to target lower regions of the brain where the stress response system is located (Fraser et al., 2017, 2019; Kilroy et al., 2019; Lane et al., 2019; Perry, 2008, 2009, 2020; Perry & Dobson, 2013; Ryan et al., 2017). Somatosensory activities focus on sensory experiences relating to touch, movement, and proprioception (the sense of body position) and sensory-based activities are commonly utilised to help relieve stress and return to a state of calm. For example, activities such as exercise (Chan et al., 2019; Hale et al., 2021), being outdoors (Corazon et al., 2019; Hansmann et al., 2007; Roberts et al., 2020), mindfulness (Pascoe et al., 2017; Taylor et al., 2021), deep breathing (Hopper et al., 2019; Malviya et al., 2022), and yoga (Bischoff et al., 2019; Cole et al., 2022; Pascoe & Bauer, 2015; Wang & Szabo, 2020) have been associated with reduced perceived levels of stress and

physiological indicators of stress (i.e., cortisol levels, heart rate, blood pressure) and can support improved self-regulation capability. The participants suggested that activities with rhythm and movement aspects may help regulation as this is related to naturally occurring rhythms, such as a mother's heartbeat and rhythm and movement, which parallels how parents soothe an upset baby (i.e., by rocking them or shushing them). This study further expands the extant literature by demonstrating that social workers understand the importance of patterned, repetitive, rhythmic activities that support self-regulation, and it provides examples of activities that can be implemented in the child's day-to-day life to improve the functioning of their regulatory ability.

Table 8

Recommended activities targeting regulation

Examples of activities described as supporting regulation
Rocking
Swinging
Swimming
Kapa haka
Deep breathing
Biking
Singing
Music
Drumming
Weighted touch (such as massage or weighted blankets)

Improvements in self-regulation functioning can occur when these activities are implemented regularly throughout the child's day. The key informants and participants sought to include regulating activities (such as those outlined in Table 8) regularly throughout the child's day. This created micro-moments and opportunities for the child's arousal levels to return to a state of calm. When activities that support regulation occur regularly the neural networks relating to the stress response system may be able to be changed, allowing for improvements in regulatory functioning (Perry, 2009, 2020; Perry & Dobson, 2013). Studies into the use of sensory interventions have largely considered their use to support regulation when dysregulation occurs (Bobier et al., 2015; Chalmers et al., 2012; Haig & Hallett, 2022; Sutton et al., 2013). This study also supports the use of sensory interventions as a mechanism to support a child struggling to manage their emotions to become regulated again. This study found that social workers believed improvements in functioning can be achieved when activities targeting regulation occur regularly throughout the child's day. This study does not definitively define how many repetitions throughout the day are necessary for change; however, it was suggested by the key informants and participants that five or six opportunities for regulation lasting for a few minutes spread throughout the day may build the child's capacity to regulate their emotions over time. This finding is an important contribution to the knowledge and practice of neurodevelopmental lenses and is an area worthy of further research.

The key informants and participants identified links between the use of cultural activities and how these often provide activities that would be recommended to support the development of regulation. For example, Rawiri linked various activities (such as kapa haka, mau rākau, waiata, and waka ama [outrigger canoe]) from te ao Māori, which have movement, rhythm, and repetitive components. These components were found in this study to be considered beneficial for developing regulation capabilities. Previous Aotearoa New Zealand research supports this finding and has identified links between a variety of activities (such as kapa haka, flax weaving, poi, and waiata) and improvements in regulation (Elder, 2013a, 2013b; Hollands

et al., 2015; Kirkwood, 2015; Sirs & Meek, 2021; Sweetman, 2017). Alongside supporting regulation, these sorts of activities can also strengthen whānau, whakapapa, and cultural connections (Elder, 2013a, 2013b; Hollands et al., 2015; Kirkwood, 2015; Sirs & Meek, 2021; Sweetman, 2017).

Several of the key informants and participants identified that a te ao Māori worldview and the neurodevelopmental lens overlap well. When considered together, culturally appropriate activities (which also support the building of connection and belonging, discussed further in the next section) can be used to address children's functional challenges (such as self-regulation). When using the neurodevelopmental lens, this study found that social workers were able to be more informed in their selection of interventions. This was especially so when they considered the intersections between activities that align with the child's cultural worldview, building relationships, and supporting the development of self-regulation with patterned, repetitive sensory interventions. Once a sense of safety is achieved and the child has been supported to become regulated, the third component of the sequence of engagement and intervention can occur. The third aspect of the heuristic is focused on relational interventions.

Relate

Once the child has developed self-regulation, the focus shifts to relationships. Relational connection and belonging was a significant theme in this study and is discussed further under the microsystem level. This section focuses on the sequencing of relational interventions. The participants in this research located relationships after regulation as a child needs to be able to be regulated before they can engage in relational interventions. The sequence of engagement suggests relational interventions, such as attachment-based interventions, should occur after the child has developed a sense of safety and self-regulation ability (Perry, 2020). The timing and sequencing of interventions is, therefore, important and should reflect the sequence of engagement.

There were overlaps between regulation and relationship within the participants' narratives. Relationships were utilised alongside other interventions. For example, Thomas described an adult and a child completing activities that support regulation in parallel (in a concept known as co-regulation). Co-regulation is informed by attachment theory, where the development of self-regulation ability occurs through parents supporting children to manage their emotions (Greer, 2015, 2021; Hughes, 2017; Kostøl & Cameron, 2021; McFerran et al., 2022). Supporting a child to feel safe and regulate their emotions and behaviours enables them to establish trusting relationships (Dawson et al., 2014; Greer, 2015, 2021). This finding suggests that adults around a child should focus on supporting the child to feel safe and become regulated through co-regulation. The final phase of the heuristic, reason, is discussed in the next section.

Reason

The last phase of the sequence of engagement is reason. Reasoning draws on the cortical regions of the brain, which develop last (Greer, 2015, 2021). The participants in this study identified that therapeutic interventions (such as talking therapy) which draw on reasoning or talking with a child needed to come after the child felt safe, were regulated, and a relational connection had occurred. Tania highlighted that talking therapy could potentially be re-traumatising for a child if they do not have the precursor abilities of self-regulation and forming relationships. Fisher (2019) noted that talking therapy often seeks to address cognitive distortions, build a new narrative of traumatic events, and focus on emotional expression without having first addressed the somatic impacts of trauma. An increasing number of therapeutic approaches seek to address self-regulation and relational aspects before talking therapy (which aligns with the neurodevelopmental lens heuristic), such as sensorimotor psychotherapy (Fisher, 2019).

The findings demonstrated that social workers utilising a neurodevelopmental lens do not discount the importance of traditional therapeutic interventions, but the sequencing and

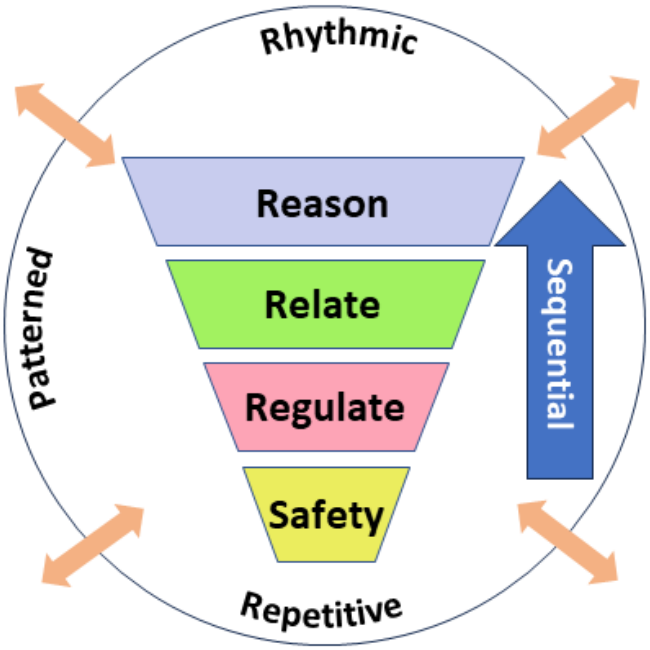
timing of interventions is important. The results illustrated how social workers decide the order of interventions using the *safety, regulate, relate, reason* neurodevelopmental lens heuristic. Interventions that rely on complex cortical processes (such as speech and language) should be focused on after the child has a sense of safety, has developed an ability to self-regulate, and has established trust-based relationships. These interventions provide a solid foundation and enable the child to engage in more traditional forms of therapy (such as talking therapy) to address the impacts of adversity.

Summary of the individual level

Located within the individual level of the ecological-transactional perspective were two existing principles of the neurodevelopmental lens (experience shapes development, and sequential development and intervention). The findings of this study extend these principles. The recurring theme of the stress response system and regulation in the literature and findings of this study was proposed as a new principle of the neurodevelopmental lens. These principles contributed towards a framework through which child protection social workers could understand the impacts of adversity and plan interventions. Figure 8 is a visual representation of the individual level of the model (the higher levels of the model are introduced throughout this chapter) that draws on the research findings and the key elements of the neurodevelopmental lens outlined in the literature. The white circle at the centre represents the individual. The orange bi-directional arrows symbolise the interactions between the individual and their environment, which captures the principle of experience shapes development. This study found that experiences are an important consideration for child protection social workers as understanding a child's history of experiences provides insight into their current functioning. Experiences are also the key mechanism through which interventions occur and are, therefore, essential to healing.

Figure 8

The individual level of the neurodevelopmental lens model



Located within the circle is Perry's model of the brain (see Chapter Four), overlaid with the adapted sequence of the engagement heuristic. This illustrates the structure of the brain and its correlating functions. The upwards arrow refers to the bottom-up sequential nature of brain development and the sequential order of intervention (as per the safety, regulate, relate, reason heuristic). The principle of sequential development and intervention creates a framework through which interventions can be selected in a developmentally appropriate manner. Interventions should address safety, followed by regulation, and then relationships, before finally utilising cortically heavy reasoning interventions (such as traditional talk therapies). Finally, the words repetitive, patterned, and rhythmic are located around the outside of the circle as these identify the process for achieving regulation and the foundation for subsequent interventions.

The next section discusses the relationship between the individual and their microsystem. The importance of relational and cultural connection and belonging are discussed within the microsystem level of the ecological system.

The microsystem

In the ecological-transactional perspective, the microsystem is the immediate environment around a child (for example, their family or school). The interactions between the child and their microsystem represent the child's relationships. This section highlights that relationships are of importance in the neurodevelopmental lens and expands the extant principle to focus on relational and cultural connection and belonging (Research Question One). This section explores how child protection social workers understand the impacts of adversity by drawing on the principle of relational and cultural connection and belonging (Research Question Two), followed by a discussion on the approaches to intervention (Research Question Three).

Adversity is experienced relationally

As discussed in Chapter Four, a key principle within the neurodevelopmental lens is that of healthy relationships as a buffer and healing mechanism from adversity (Perry, 2001, 2006, 2008, 2009). This research found a focus on connection and belonging was important as it directly counters the experiences of disconnection and severing of relationships that adversity can cause. The results of this study highlighted two key areas where connection and belonging can be achieved: through positive relationships and through cultural identity. The next two sections extend the existing neurodevelopmental lens principle of relationships to a focus on relational and cultural connection and belonging. The proposed revised principle of connection and belonging can be summarised as:

Connection and belonging

Development occurs within the context of relationships. Experiences of adversity (including structural forms) often have a relational component. Relational and cultural connection and belonging are protective and can address the impacts of adversity.

The participants identified that humans grow up within relationships, and relational connections influence development. Perry (2009) explained that for approximately 200,000 years humans lived in small, multi-generational, interdependent clans who were fully reliant on each other for survival. This understanding informed the participants' and neurodevelopmental lens' focus on relationships as a mechanism for understanding and addressing the impacts of adversity (Perry, 2006, 2008, 2009). The social context humans grow up in means that adversity is often experienced relationally (Dyer & Chisnell, 2023; Perry, 2009). This view was supported by the participants' (for example, Jocelyn, Thomas, and Jane) understanding of the revised principle of connection and belonging. The relational nature of adversity is sometimes apparent, for instance, in sexual or physical abuse where another person is a perpetrator. Yet, the impact of adversity arising from structural factors (such as poverty) is less clear. This study found that structural factors affected the microsystem (this is explored in greater detail in the macrosystem section). The ecological-transactional perspective (introduced in Chapter Two as the theoretical framework) provides insight into how adversity is experienced relationally. The perspective posits that the various levels of the ecological system interact together, ultimately affecting development (Belsky, 1980; Cicchetti & Lynch, 1993; Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019). Macrosystem factors, such as poverty arising from structural inequity in the macrosystem, influence and result in adaptations within the microsystem; for example, limited access to nutritious food and increased parental stress levels. The macrosystem interacts with the microsystem, which affects the interactions between the microsystem and the individual. As such, the ecological-transactional perspective posits that macrosystem factors result in

adversity through changes to the microsystem, which are then experienced relationally by the child. The finding in this research that adversity is understood to be experienced relationally is an important contribution to the knowledge and practice of the neurodevelopmental lens. It provides a framework through which experiences of adversity (at multiple levels of the ecological system) and the impact on the child's relationships and functioning can be understood.

This study found that child protection social workers understand that adversity affected the way in which children relate to others (referred to as a relational template). Relational templates were described by key informant John as being a filter through which all person-to-person interactions are processed and developed through relational experiences. As such, relational templates affect current (and future) behaviour, functioning, and relational interactions. John's description of relationships is closely linked to attachment theory (as described in Chapter Four; Ainsworth et al., 1978; Bowlby, 1958, 1969, 1973; Bowlby, 1988), which was referenced by more than half of the participants (Thomas, Amanda, David, Rawiri, Jocelyn, Rebecca, and Jane). Attachment theory suggests that the bonds formed between children and their caregivers provide important patterns for their social and emotional functioning and how children relate to others later in life. The caregivers' response to the child is believed to impact how their attachment style develops. This study found that social workers drew on their understanding of attachment theory when using the neurodevelopmental lens by considering the child's history of relationships and how these may have affected their attachment relationships. For example, Amanda stated that when a child has a history of repeated experiences that may be fearful or frightening to them, they may develop an attachment style that makes them more reactive to perceived threats. Amanda used this to help those involved with the child understand and empathise with the child's behaviour. Behaviour is framed as an understandable response developed from a child's history of relationships and as a way to keep themselves safe (Carriere & Richardson, 2013; Richardson & Bonnah, 2015). As such, this study highlighted that a social worker's understanding of the

child's history of relationships enables them to explore the reasons behind the child's behaviour, resulting in more empathetic responses to the child and further strengthening the child's relationships.

When discussing relationships, the participants in this research focused on the child's relationships. The neurodevelopmental lens emphasises the importance of the quality, number, and stability of relationships (Hambrick, Brawner, & Perry, 2018; Perry, 2001, 2006, 2008, 2009, 2020; Ungar & Perry, 2012). This focus addresses one of the critiques of attachment theory. Attachment theory has been critiqued as attachment is typically seen as a dyadic relationship with the caregiver and does not reflect the reality of the child's world with multiple caregivers and networks of support (Granqvist et al., 2017). This is particularly problematic within collective cultures (for example, Māori and Pacific people groups) where children are seen as interconnected and a collective approach to raising tamariki (children) occurs (Carriere & Richardson, 2009; Flemming, 2016, 2018; Pihama et al., 2021). Therefore, it is important that child protection social workers seek to understand the quality of the child's numerous relationships and how adversity may have affected these relationships. Adversity can result in relational and cultural disconnection, and this impact is now discussed further.

Relational and cultural disconnection

The participants emphasised that experiences of adversity can result in relational and cultural disconnection. For example, children may be removed from their families and placed in foster care. Foster care has been found to result in significant feelings of disconnection and lack of belonging (Fylkenses et al., 2021; Johnson et al., 2020; Skoog et al., 2015; VOYCE - Whakarongo Mai, 2022). This study found that it is important for child protection social workers to consider how a child's relationships may have been impacted due to experiences of adversity. An ecological-transactional perspective posits that interactions with the child's microsystem (i.e., the relationships with those around them) have a significant impact on development (Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019).

Changes to or severing of relationships directly affect the child's relationship and interactions with the microsystem. Consideration of how relationships have changed is important for social workers seeking to understand the impacts of adversity using the neurodevelopmental lens. It provides insight into feelings of disconnection that may arise from a child having severed relationships following adversity and may further add to the experiences of adversity.

Furthermore, changes in relationships can also impact a child's connection to their culture. As discussed in Chapter Four, key informant Anna and the literature, framed culture as being a core part of our identity (and is important to Indigenous well-being), who we are, how we relate to the world and others, and what we do (Fast et al., 2019; Harder et al., 2020; Krakouer et al., 2018; Mafile'o, 2019; Pihama et al., 2021; Reid et al., 2016). The key informants and participants articulated that we develop an understanding of our culture through our experiences of it, which typically occur within our family setting (for example, through our family practices and routines which occur on a day-to-day basis and through the stories we are told which help us make sense of the world). Changes to relationships can, therefore, have an impact on a child's connection to their culture and well-being. This is particularly true for children in foster care placed outside of their family, as they will be learning about and experiencing another family's culture (Krakouer et al., 2018; Schwartz, 2007). It is difficult for others (especially those outside of the family group) to provide the experiences or teach others about a child's culture, resulting in disconnection from cultural identity (Krakouer et al., 2018; Mendes et al., 2016; Pihama et al., 2021; Schwartz, 2007). The neurodevelopmental lens currently considers the impacts of relational disconnection. However, the findings of this study suggest that child protection social workers should explore how adversity has affected a child's connection to their culture, as this is an important aspect of well-being, particularly for Indigenous people and collective migrant cultures, such as Pacific people.

The consideration of cultural connection has implications for the knowledge and practice of the neurodevelopmental lens. Social workers should seek to explore the child's connection to

their culture (and whether disconnection has occurred because of entering foster care) and the impacts of colonisation on the child and family. This may provide insight and understanding of the multi-faceted impacts of adversity. The integration of culture within the neurodevelopmental lens addresses calls for the lens to include a stronger focus on culture for Indigenous people (Cox et al., 2020). Perry (2020) has also recognised the need to develop culturally sensitive training within the neurodevelopmental lens. This study has found that child protection social workers in Aotearoa New Zealand are cognisant of the links between relationships with family and culture and that adversity can result in both relational and cultural disconnection. Therefore, exploring the impacts of adversity on both relationships and culture is important to the neurodevelopmental lens.

The discussion now turns to how social workers can plan interventions within the microsystem with a particular focus on supporting relational and cultural connection and belonging.

Building connection and belonging

Relationships were found within this study to be protective and a source of healing. As discussed previously in Chapter Four, positive and trusting relationships are a key factor in building resilience and managing the impacts of childhood adversity (Bell & Romano, 2015; Dawson et al., 2014; Duh-Leong et al., 2021; Friedli, 2009; Hambrick, Brawner, & Perry, 2018; McLaughlin et al., 2015; Perry, 2009; Sanders et al., 2017, 2018; Ungar, 2005, 2013a, 2013b; Ungar et al., 2013). The relational view of resilience (which is defined and discussed in Chapter Four) found in this study and the literature places supportive relationships as central to positive adaptation following adversity as relationships are a key mechanism through which individuals navigate to the resources they need and negotiate having these resources provided in meaningful ways (Ungar, 2005, 2021; Ungar & Perry, 2012; Walsh, 2021).

One of the most significant ways that experiences of adversity can be overcome is through the strengthening of relationships. A strong focus on strengthening relationships was found in all

the key informant and participant interviews. Jocelyn, Emily, Thomas, and Jane explicitly stated (in almost identical wording) that healing occurs in the context of relationships. There was a focus on supporting parents' and families' relationships with the child. For example, Jocelyn spoke about possible interventions including coaching and supporting parents in strengthening their relationship with the child and their attachment relationships. Strengthening the quality, number, and stability of relationships around a child supports children to overcome their experiences of adversity (Perry, 2006, 2008, 2009, 2020; Perry & Dobson, 2013); especially since adversity is often experienced relationally (as discussed previously). Social workers sought to work on enhancing the quality of relationships around a child as a strategy for helping them to heal from adversity (Cushing et al., 2014; Hambrick, Brawner, & Perry, 2018; Hambrick, Brawner, Perry, Brandt, et al., 2018).

There was a focus on supporting and strengthening multiple relationships by some participants (for example, Charlotte and key informants John and Mere), whereas others (such as Sheryl, Rebecca, and Emily) indicated strengthening the child's relationship with one trusted adult. This initially appeared to be a tension within the data between focusing on single or multiple relationships; however, this was discussed further with Sheryl, who indicated that the starting position was to always focus on strengthening one key relationship initially and then working on other relationships. As mentioned previously, the quality and quantity of current relationships have been found to predict improved functioning (Hambrick, Brawner, & Perry, 2018; Hambrick, Brawner, Perry, Brandt, et al., 2018). This study reinforces the existing perspective that working to strengthen and support multiple relationships was important to the neurodevelopmental lens and was a key mechanism through which social workers could address the impacts of adversity.

Relationships are a key mechanism through which a child's attachment style can be altered, supporting them to improve their ability to navigate social interactions and improve their ability to regulate responses to stressors. Through supporting and strengthening healthy,

positive interactions the key informants and participants believed the child was able to be supported to form healthy attachments (often with their family) and experience improvements in their functioning. Attachment styles are not static and are, therefore, open to environmental influences (Fraley & Roisman, 2019; Granqvist et al., 2017; Levendosky et al., 2011; White et al., 2020). The findings demonstrated that attachment styles can be changed through stable relationships and environmental changes. This understanding guided social workers to focus on strengthening attachment between children and those around them. This is important as it speaks to the capacity for change when the right supports are put in place for families (Fraley & Roisman, 2019; Granqvist et al., 2017; Levendosky et al., 2011; White et al., 2020). Attachment theory can be useful within child protection social work when framed as 'relationship-based practice' where the theory is used to understand how to strengthen relationships and networks, promote a sense of security and resilience, and maintain and create loving and affectionate bonds (Granqvist et al., 2017; Keddell, 2017b; White et al., 2020). The focus on relationships and the participants' articulation of how attachment theory supports their understanding of the neurodevelopmental lens further highlights the importance of supporting and strengthening a child's relationships as a key mechanism through which they can support children to overcome their experiences of adversity.

This study proposes a deepening of the neurodevelopmental lens' focus on relationships to instead focus on relationships that support a sense of connection and belonging for the child. It is well known that children in state care are likely to have numerous placements and other changes, such as disconnection from their family, friends, schools, or others who are important to them (Perry, 2009; Rebstock et al., 2015b; Rock et al., 2015; Stenason & Romano, 2023). These changes result in the severing of important relationships between children and their whānau (and other supports), which can be distressing and lead to a sense of loss and abandonment (Chambers et al., 2018; Leitch, 2022; Mitchell, 2018; Rebstock et al., 2015b, p. 45; VOYCE - Whakarongo Mai, 2022; Wilson et al., 2020). Through concentrating on building the child's sense of connection and belonging, the key informants and participants directly

challenged experiences of disconnection and relational instability that may arise from being in foster care.

A sense of connection and belonging was supported through the orientation towards creating long-term relationships for children. This was illustrated by Emily, who highlighted their focus was on lifelong connections and key informant John, who posed a pertinent hypothetical question to the effect of "who is this child going to have Christmas with when they are older"? This long-term focus is important as it shifts the focus from immediate safety needs (which the child protection system typically focuses on) to creating lifelong connections and belonging (Atwool, 2020; Cushing et al., 2014). The long-term relational focus of the participants is supported by research looking at the supports young people utilise when they transition out of state care into adulthood. Atwool (2020) highlighted family and social support are important as when young people transition away from the formal supports offered by state care, they become more reliant on relationally based, informal social supports. Research has found that children who leave care often reconnect with their families (Atwool, 2020; Collins et al., 2008; Cushing et al., 2014; VOYCE - Whakarongo Mai, 2022). The findings of this study showed social workers utilising a neurodevelopmental lens actively seek to create a sense of long-term connection and belonging. This suggests they altered their practice approach to resist the disconnection that often occurs within the child protection system. Strengthening and supporting long-term relationships that foster a sense of connection and belonging is, therefore, a way social workers can utilise the neurodevelopmental lens to support children to overcome their experiences of adversity.

The key informants and participants sought opportunities to build a child's connection and belonging through relationships with others in their network (for example, peers, foster parents, teachers, coaches, or neighbours). One way the key informants and participants achieved this was through finding activities that interested the child. For example, Rawiri spoke about utilising a mathematics group to create a place of belonging for a child interested

in mathematics and key informant John spoke about activities such as sports and dance. Hobbies and recreational activities were found in this study to create opportunities for children to build connections with peers with similar backgrounds and interests (Atwool, 2020). Programmes or activities that build on the strengths and interests of a child or young person have been found to promote confidence, self-esteem, improved emotional regulation, and positive social relationships (Mannay et al., 2022). Social workers can identify opportunities for the child or young person to engage in activities of interest and support and encourage the child to attend these. Through engaging in hobbies and activities, the child may be supported to form new relationships, further strengthening their microsystem.

This section highlighted the importance of supporting the building of relational connection and belonging for children who have experienced adversity. The next subsection discusses how child protection social workers utilise relationships to support cultural connection and belonging.

Supporting cultural connection and belonging

This study deepens the understanding and focus of the neurodevelopmental lens to include cultural connection and belonging. This study found that social workers took numerous steps to support cultural connection, such as including cultural activities, finding family, hapū, or iwi members and supporting children to visit their whenua and marae. As discussed previously, culture is developed through our experiences, typically through connections with the microsystem, especially with family (Krakouer et al., 2018; Mendes et al., 2016; Schwartz, 2007). Key informant Mere was emphatic that it is the child's family who must support the child's understanding and connection to their culture. Supporting whakapapa relationships helps children learn about who they are, form deep relationships, and understand their roles and responsibilities to others (Pihama et al., 2021). There is, therefore, a close link between relational and cultural connection and belonging. Supporting and strengthening a child's relationships with cultural support networks is an important way social workers can utilise a

neurodevelopmental lens in their practice to support children to achieve cultural connection and belonging and contribute to overcoming experiences of adversity.

Social workers identified interventions that strengthened a child's connection to their cultural heritage. For example, Sheryl described the use of stories and activities from the child's culture to help them learn about their culture. The key informants and participants also discussed how they included activities for tamariki Māori, such as kapa haka, flax weaving, waiata, and karakia, within the child's daily routine. The inclusion of traditional Māori cultural activities in the child's day-to-day life was found in this study and in previous research to support children to overcome adversity as they were considered to have a grounding and regulating effect (as discussed previously in Chapter Four and the regulate section of the engagement and intervention sequence; Elder, 2013a; Elder, 2013b; Hollands et al., 2015; Kirkwood, 2015; Sirs & Meek, 2021; Sweetman, 2017). This finding is not currently prominent within the neurodevelopmental lens literature and contributes to a deepening of the understanding of this principle. The role cultural activities can play in addressing adversity is a significant contribution to the knowledge base of the neurodevelopmental lens as they support connection and belonging.

The inclusion of culture within a neurodevelopmental lens is important for several reasons. Firstly, supporting a child's connection to their cultural identity is not just best practice but is a human right outlined in the UNCROC (Articles 7, 8, 9, 30, and 31; Fitzmaurice-Brown, 2022; Harder et al., 2020) and the UNDRIP (Fitzmaurice-Brown, 2022). Secondly, a sense of belonging and connection to family, community, and culture are important aspects of identity development and well-being. This was found in this study and supported by previous research (Durie, 2011; Fast, 2014; Krakouer et al., 2018; Mendes et al., 2016). Finally, connecting children and young people to their culture can also open up greater networks of support (Munford & Sanders, 2021; Pihama et al., 2021). For example, Sheryl and Tania identified that connection to a child's culture enables access to broader support networks for Māori children

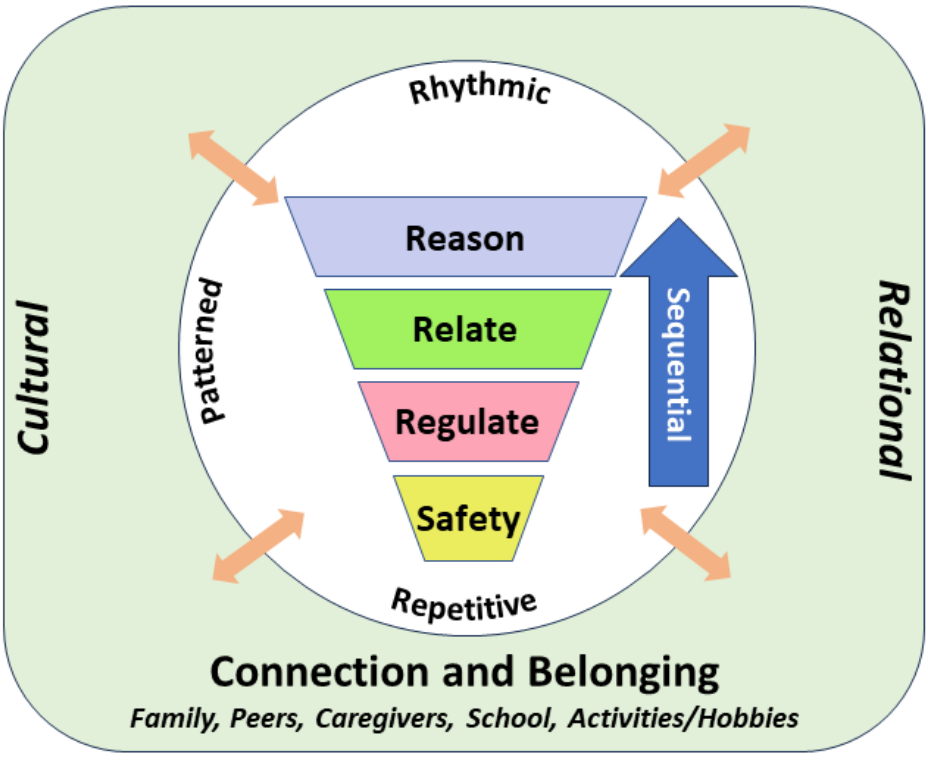
through their whānau, hapū, and iwi. Further research exploring the intersection of culture, connection and belonging, and the neurodevelopmental lens is, therefore, necessary. This study proposes that culture is integrated into the neurodevelopmental lens as connection to culture is an important aspect of well-being and it supports holistic and culturally appropriate social work practice.

Summary of the microsystem

The microsystem consists of the immediate relationships between the individual and their environment. This study reinforced the importance of relationships as important to understanding and addressing adversity. It furthered the extant knowledge and practice through a focus on both relational and cultural connection and belonging. Adversity is often experienced relationally and can result in both cultural and relational disconnection. This study found child protection social workers planned interventions to build cultural and relational connection and belonging. Figure 9 extends the neurodevelopmental lens model by including the microsystem. The words connection and belonging (along with some prompts of how this can be achieved), and cultural and relational are located within the microsystem. The orange arrows represent the interactions between the microsystem and the child. The discussion now expands the model further through exploring the mesosystem.

Figure 9

The microsystem level of the neurodevelopmental lens model



The mesosystem

In the ecological-transactional perspective, the mesosystem is the interactions between two or more microsystems (i.e., the interaction between the family and the school). The interactions between the various microsystems can have an impact on the child. This research found that social workers play an important role in supporting the mesosystem to work collaboratively through establishing a network of the various microsystems, referred to in this study as the therapeutic web. The therapeutic web is an important component of the NMT model and was a recurring theme in the literature (see Chapter Four). This section proposes the concept of the therapeutic web is elevated to a new principle of the therapeutic web as a key mechanism to support the child's family and those working with children to work collaboratively and in a coordinated manner across the microsystems (Research Question One). This section also

discusses how the participants worked to build a shared understanding of the child's history and the impacts of adversity (Research Question Two) and to plan consistent interventions with the therapeutic web (Research Question Three).

Creating a therapeutic web

Social workers work with the multiple levels of the ecological system surrounding a child. This study found that social workers often coordinate between all of those involved in a child's life (referred to in this study as the therapeutic web and discussed previously in Chapters Four and Five). The participants explained how they work across and unify the various systems and professionals, such as home and school, to help them understand the child and to plan coordinated interventions. Thomas referred to this as the therapeutic web; this aligns with the neurodevelopmental lens' focus, discussed previously, on strengthening the relational milieu of the child and facilitating healthy relational connections for the child (Perry, 2008, 2020; Perry & Dobson, 2013). Through creating a therapeutic web around the child, relationships provide protection from adversity and are a key mechanism for healing. Whilst currently a key theme of the NMT literature, this study proposes that the therapeutic web is elevated to a principle due to the importance of working collaboratively. The proposed principle of creating a therapeutic web can be summarised as:

Creating a therapeutic web

The therapeutic web is the network of those involved with a child. The therapeutic web works collaboratively together, is led by the child and their family, and is a supportive network that builds a shared understanding of the child's strengths and needs and plans interventions across the child's systems to support their well-being.

The collaborative approach of bringing together the various systems described by the participants could be further supported through a wraparound approach. Wraparound

approaches utilise a family-driven, team-based approach to coordinate care and services for a child or young person (wraparound approaches are described in greater detail in Bruns & Walker, 2015; Bruns et al., 2008; Bruns et al., 2010; van den Berg & Grealish, 1996). The use of the wraparound process in Aotearoa New Zealand with young people in mental health services has been found to have positive results (Shailer et al., 2018). Whilst the NMT is not specifically a wraparound approach (Perry & Dobson, 2013), some similarities exist and the lens may further be strengthened by integrating the wraparound process. Processes of the wraparound approach were described by the participants in this study. In particular, the key informants and participants placed emphasis on the role of empowering the family and/or whānau to take leadership within the therapeutic web. For example, Mere described the whānau as holding the keys to healing. The importance of family inclusion within child protection social work has been well established within the literature (Davies et al., 2023; Herbell et al., 2024). Empowering and including families to take leadership within the therapeutic web directly contrasts and repositions the power child protection social workers can have over families (Davies et al., 2023). Furthermore, the approach articulated by the key informants and participants prioritises children and families as experts in their own lives (Davies et al., 2023).

The holistic approach described in this study allowed for coordinated, individualised care planning across the various systems, whilst keeping the voice of the child or young person, their family, and the natural supports at the centre of planning. Coordinated and collaborative approaches support increased communications which can address the disconnection between home and school felt by foster parents (Harlow, 2021). Integrating the wraparound approach with the neurodevelopmental lens may further strengthen the neurodevelopmental lens through providing a structured process and principles for the therapeutic web to operate.

The therapeutic web approach enables the coordination of intervention plans across the various systems surrounding a child. A coordinated approach is necessary in the

neurodevelopmental lens as predictable and repeated activities and interventions across a child's day are necessary (Perry, 2020; Perry & Dobson, 2013). The participants described the importance of integrating regulating activities (discussed further in the regulate subsection of the engagement and intervention sequence section) repetitively throughout the child's day and week. Numerous repetitions of activities require investment in and support from the child's various environments. Like most models, research into the NMT has found adherence to treatment recommendations results in improved intervention success and outcomes for children and young people who have experienced adversity (Evans et al., 2023). It is, therefore, important that the recommended interventions are implemented, and this requires working across various systems surrounding the child. This study further supports the neurodevelopmental lens approach of utilising the therapeutic web; meeting regularly enabled the participants to collaborate with others and coordinate the implementation of intervention plans.

Working in an interdisciplinary manner can present challenges. Professionals must be able to navigate the differing theoretical positionings of their respective professions (Frost & Robinson, 2007; McLean, 2012; Messenger, 2013). This was a challenge identified in the current study where participants spoke about differing perspectives, particularly with the education and mental health professions. For example, the participants discussed how traditional approaches to behaviour management could at times conflict with a neurodevelopmental lens approach. A similar challenge was identified by the participants, and in the extant social work literature, where tensions can arise when the diagnosis of ADHD is provided when children have a history of trauma, where there can be overlapping symptoms and/or comorbidity making diagnosis difficult (Boodoo et al., 2022; Hunt, 2020; Szymanski et al., 2011). It is outside of the scope of this thesis to discuss the ADHD/trauma diagnostic overlap further (see Boodoo et al., 2022; Hunt, 2020; Szymanski et al., 2011 for a fuller discussion on this overlap). The findings of this study emphasised the importance of developing a shared understanding of the historical context of the child to enable other

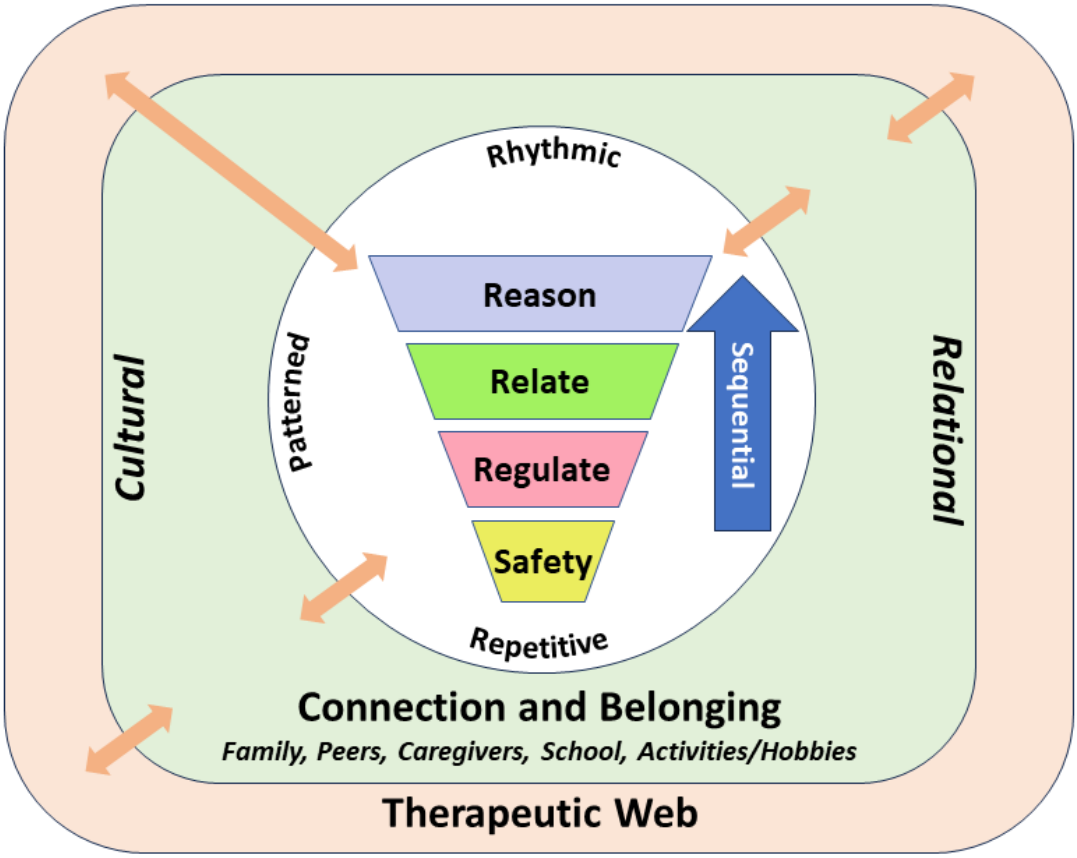
professionals working with the child to accurately assess and support a child and their family and undertake collaborative intervention planning. This is particularly important when mental health and child protection professionals are working together (Monson et al., 2021).

Summary of the mesosystem

The mesosystem is the interactions between the various microsystems surrounding a child. This study found that bringing together the adults around the child (through the therapeutic web) facilitated collaboration and coordination of intervention plans. Child protection social workers created a shared understanding of the child's history and current functioning and developed intervention plans that spanned the various systems with which a child is involved. Figure 10 extends the neurodevelopmental lens model by including the mesosystem and the therapeutic web. Again, the orange arrows represent the interactions and influence between the various systems around a child. In the final section of this chapter, the broader systems, the exosystem and macrosystem, are explored.

Figure 10

The mesosystem level of the neurodevelopmental lens model



The exosystem and macrosystem

The exosystem includes the broader systems which have influence over the child but which the child is not directly involved with (for example, a parent's work environment). The exosystem has an impact on the child, the microsystem, and the mesosystem. It is important that social workers are aware of possible risk factors located within the exosystem as these can intersect with the inner systems, creating additional pressures for the child. For example, parental workplace stressors may increase parental stress, which unintentionally impacts their interactions with the child. As already discussed, stressors in broader systems are experienced relationally.

The macrosystem is the furthest level from the individual. Located within the macrosystem are structural factors and societal values and beliefs. Like other systems in the ecological-transactional perspective, the macrosystem interacts with the other levels of the ecological system resulting in impacts on development (Belsky, 1980; Cicchetti & Valentino, 2006; Harms & Connolly, 2019). This study found that consideration of structural adversity was important to child protection social workers and could be included as a principle in the neurodevelopmental lens (Research Question One). The participants used the proposed principle of consideration of structural adversity to inform their understanding of the impacts of adversity (Research Question Two).

Structural adversity

The consideration of structural factors is an important contribution to the knowledge and practice of the neurodevelopmental lens as it provides a broader understanding of adversity for children and their families. The neurodevelopmental lens does not currently consider structural adversity, and this is an area where this study proposes an additional neurodevelopmental lens principle. The proposed principle of structural adversity can be summarised as:

Structural adversity

Structural forms of adversity impact on a child and their family and are often experienced relationally by the child. A relational-multisystemic analysis supports the exploration of how structural forms of adversity can be addressed. Structural adversity can be addressed through advocacy and supporting access to appropriate services and entitlements.

When discussing structural forms of adversity (such as poverty and colonisation), the participants linked macrosystem factors to the impacts on the systems immediately surrounding a child (for example, the family). The ecological-transactional framework (as discussed in Chapter Two) identifies risk and protective factors (both enduring and temporary) at each level of the ecological system and explores how these interact with other ecological systems to influence development (Cicchetti & Lynch, 1993; Cicchetti & Valentino, 2006; MacKenzie et al., 2011; Polak & Saini, 2019). This understanding is explained using two examples of structural factors: poverty and colonisation.

Poverty is typically an enduring macrosystem factor (although it can be transient, for example, through loss of employment and then re-entry into the workforce) arising from societal structures and systems, such as the impact of capitalism and neoliberalism (Morley & Ablett, 2017). Neoliberal ideology emphasises individual responsibility and a free market (Kane, 2018; Stanley-Clarke, 2015). Parents are positioned as responsible for meeting the needs of their children and navigating the market in order to better their own family (Kane, 2018). The neoliberal free market largely determines the value of labour, and low wages contribute to economic inequality (Kane, 2018). Without investment in education or skills, an individual is likely to struggle to offer greater perceived value to the market, making it difficult for them to improve their financial situation. Kane (2018) summarised this as: "inequitable outcomes are presumed to be the result of those choices, made more successfully by those with the values and capacities for self-reliance" (p. 68). Structural factors, such as the role of the free market,

contribute to economic inequality (and thus poverty) and are largely unable to be changed by the individual. Structural factors, therefore, have a direct impact on the individual and the microsystem.

Several participants identified how housing, inadequate access to sufficient or healthy food, and financial insecurity directly affected the child's microsystem. For example, families living in overcrowded and inadequate housing can experience increased stress levels as parents are *"just trying to survive"* (Sheryl). Furthermore, this study found that social workers understood poverty to affect a child's relational experiences through diminishing parents' capacity to care for and respond in an attuned manner to the child. The impacts of poverty on families can also intersect with other forms of adversity which further affect the relational experiences of the child, such as substance abuse, mental health, and domestic violence. Structural factors, such as gender, disability, ethnicity, and age, have also been found to contribute to adversity (Bywaters et al., 2018; Bywaters et al., 2016; Bywaters et al., 2022). This understanding of the relational link between structural factors, parenting and child development, aligns with the family stress framework (Bywaters et al., 2022; Conger, 2000, as cited in Bywaters, 2022; Duncan et al., 2014; Evans & Kim, 2013; Granqvist et al., 2017).[41] The family stress theory is a useful framework for understanding structural adversity as it builds an understanding of how structural factors (such as poverty) can interact with a child's microsystem, increasing stress levels, psychological distress, and parents' capacity to care leading to developmental impacts. Therefore, it is pertinent that social workers pay attention to the possible impacts of macrosystem factors and how these may be affecting the child and the microsystems surrounding them.

Alongside poverty, the impact(s) of colonisation (previously discussed in Chapters One and Four) on Māori was an important structural consideration for the participants in this study.

[41] The family stress framework was introduced in Chapter Four.

Consistent with Aotearoa New Zealand scholars, they recognised that the ongoing intergenerational impacts of colonisation on the well-being of Māori have resulted in disconnection from culture, whānau, and whenua (Fitzmaurice-Brown, 2022; Hyslop, 2022; Pihama et al., 2021; Pihama et al., 2017; Reid et al., 2016). Colonisation was framed in this research as the "destruction" of culture (by participant Emily), having ongoing impacts on children and families. The impacts of colonisation at the macrosystem level were understood in this study to impact on the inner systems of the ecological framework, such as through the breakdown of relationships. Given that connection to culture was found in this study to be connected to well-being, it is important that child protection social workers consider the possible impacts on a child's connection to their culture and how structural factors may be contributing to this. As previously discussed in Chapter One, tamariki and whānau Māori (Māori children and families) within Aotearoa New Zealand are significantly overrepresented within the child protection system (Fitzmaurice-Brown, 2022; Rebstock et al., 2015a, 2015b). In recent years in Aotearoa New Zealand, there have been strong public calls for decolonisation of the child protection system and greater emphasis on supporting cultural identity in order to enhance the well-being of children and their whānau (Fitzmaurice-Brown, 2022). This focus within child protection social work is likely to have had an influence on the participants' understanding and articulation of the importance of culture in their practice.

The examples of poverty and colonisation and the cascading interactions between the various levels of the ecological system provide insight into how structural and systemic forms of adversity are understood to be experienced relationally. Structural forces in the macrosystem are often invisible but have a multi-level systemic impact, resulting in the impacts being experienced relationally through changes in the microsystem. This understanding is proposed as a *relational-multisystemic* understanding of adversity. A relational-multisystemic understanding allows for the consideration of how broader, often unseen, aspects of adversity (such as structural factors) impact on relationships and, therefore, the child.

A relational-multisystemic analysis provides social workers with a deeper analysis of a family's situation and enables them to build an understanding of the impacts of structural factors on their day-to-day lives (as stated by Jocelyn). This study found that social workers reflected on the structural impacts on a family. The family's response and increased levels of stress arising from structural factors were positioned as expected and understandable. Furthermore, the relational-multisystemic focus addresses the critiques of the use of neuroscience and the neurodevelopmental lens in practice as individualistic and failing to consider the impact of societal structures and systems located in the macrosystem (see Chapter Three; Beddoe & Joy, 2017; Gillies et al., 2017; Joy, 2022; Munro & Musholt, 2014; Wastell & White, 2012). Through the relational-multisystemic focus developed in this research, social workers can adopt a both/and consideration of structural issues[42] and the resulting relational experiences of adversity, thus responding to the individualistic critique of neuroscience. Furthermore, it also ensures there is alignment with the social work profession's focus on the intersection of structural factors and individual well-being (IFSW & IASSW, 2014; Joy, 2022; Ornellas et al., 2016).

Whilst social workers were cognisant of the impacts of adversity, the data was less clear on how social workers planned interventions to address structural forms of adversity. This is an area worthy of further research. Structural forms of adversity are somewhat difficult to change given that these arise from structural inequity and societal norms and values. By drawing on the understanding structural factors are likely to contribute to stress for the family, this study suggested social workers should take practical steps to alleviate their impacts. Inferences can be drawn from the data that suggest the participants focused on mitigating the impacts of structural adversity at the individual, microsystem, and exosystem levels. This included advocating for and supporting clients to appropriate access to services (such as for access to benefits to address poverty or stable housing; Munford & Sanders, 2021) or providing financial

[42] As advocated for by Joy, 2022 and discussed in Chapters Three and Four.

and practical support, as advocated by Featherstone et al. (2018). Through taking practical actions, social workers can work to alleviate the impacts of poverty on children and families.

Insights into how child protection social workers can challenge colonisation were also identified in the study. In Aotearoa New Zealand colonisation has directly resulted in disconnection from culture for Māori and overrepresentation in a number of poor outcomes (Hyslop, 2022; Joy, 2022; Pihama et al., 2021). Entry into foster care can further perpetuate colonisation through the disconnection of children from their culture (Carriere & Richardson, 2013; Krakouer et al., 2018; Pihama et al., 2021; VOYCE - Whakarongo Mai, 2022). The study found social workers valued the importance of culture and actively sought to connect children to their culture. Examples of the actions described in this study include working in partnership with the child's family (see the Therapeutic web section), drawing on cultural activities, supporting relational connection and belonging, and enabling the child to connect to their whenua. Through adopting a cultural lens and focusing on creating cultural connection and belonging (as discussed extensively in the Building connection and belonging section), the participants in this study sought to actively resist the impacts of colonisation.

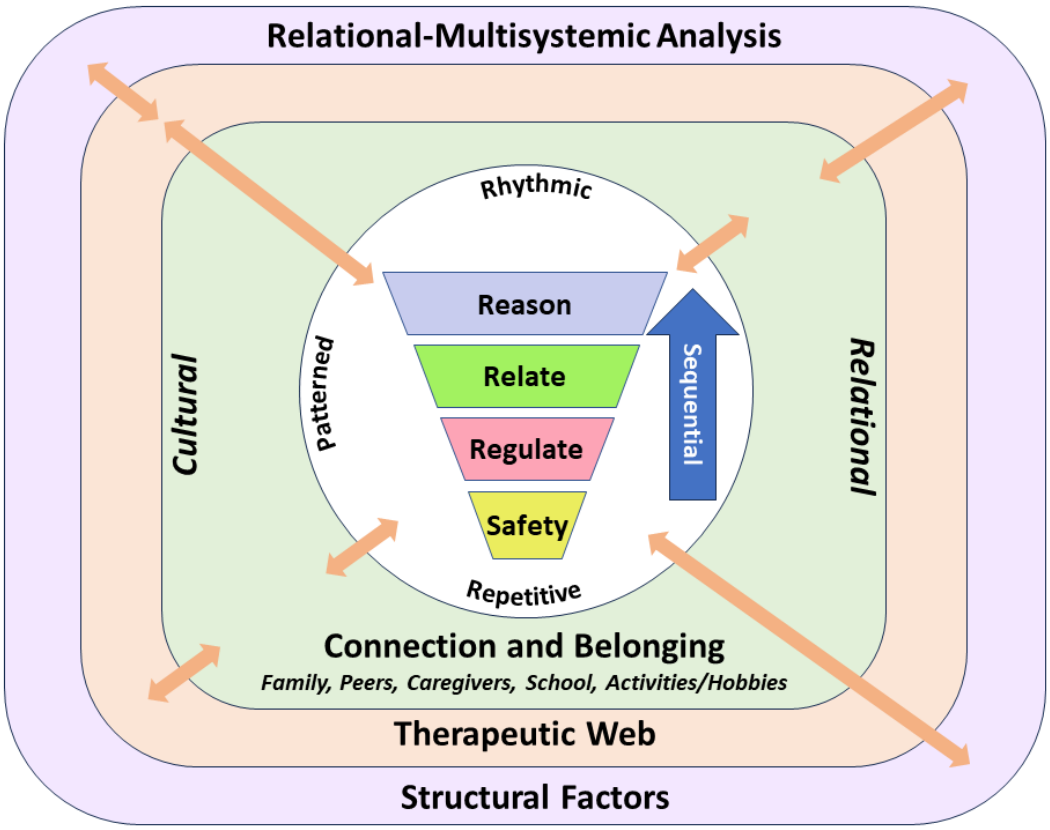
Summary of the macrosystem

The consideration of structural adversity, particularly through a relational-multisystemic understanding, expands the current knowledge and practice of a neurodevelopmental lens. The findings of this study emphasise the importance of considering structural forms of adversity and how these may impact children and families and be experienced relationally (a relational-multisystemic analysis). This provides a broader context to the neurodevelopmental lens' understanding of adversity. Furthermore, this finding is important as it provides a framework through which social workers can apply the neurodevelopmental lens to consider structural adversity. This allows for the neurodevelopmental lens to consider both structural and individual forms of adversity, aligning with the profession's focus (IFSW & IASSW, 2014; Joy, 2022; Ornellas et al., 2016) and overcoming the risk of an individualistic

focus discussed in Chapter Three. The macrosystem is represented in the final level of the neurodevelopmental lens model, Structural Factors and Relational-Multisystemic Analysis (see Figure 11). This reminds child protection workers to consider the possible impacts of structural factors on children and families and how these may be experienced relationally. Social workers should also consider how they can address and alleviate the impacts of structural factors on children and families.

Figure 11

The macrosystem level of the neurodevelopmental lens model



Chapter summary

This chapter addressed the first three research questions and introduced a model that draws on the findings from this study (Research Question Four; this is discussed in greater detail in the next chapter). This study extended two (experience shapes development and sequential developmental and intervention) extant principles of the neurodevelopmental lens and proposed a shift in focus from the principle of relationships to relational and cultural connection and belonging. The findings of this study suggested that the recurring themes found in the extant literature of the stress response system and regulation and the therapeutic web should also have their own principles. The research has also proposed a new principle about the importance of considering the impact of structural factors on development and how these are experienced relationally. The principles of the neurodevelopmental lens provide child protection social workers with a framework through which to understand the impacts of adversity and to plan interventions to address these impacts. The study drew on an ecological-transactional perspective as the theoretical framework for this research (Chapter Two). The use of this approach enabled insight into how social workers understand the impacts of adversity at multiple levels of the ecological system and how they develop intervention plans to address these impacts. This research found that the principles of the neurodevelopmental lens should be considered together. For example, interventions should contain a relational aspect, be culturally relevant, and target the areas of the lowest region of the brain first. This will result in the most appropriate interventions for children who have experienced adversity.

The final chapter concludes the thesis. The discussion builds on the model developed in this chapter, addressing the final research question. Implications for practice and recommendations for future research are presented.

Chapter Seven: Conclusion and recommendations

This research explored how child protection social workers understand and address the impacts of childhood adversity through a neurodevelopmental lens. The study sought to make a significant contribution to the knowledge, understanding, and practice of professional social work in this area. Four key research questions were proposed in Chapter One:

1. What principles do child protection social workers view as being important to the neurodevelopmental lens?
2. How do child protection social workers use the principles of neurodevelopment to understand the impact of childhood adversity on their clients?
3. How do child protection social workers use the principles of neurodevelopment to inform intervention planning?
4. How could a model based on a neurodevelopmental lens be utilised in the Aotearoa New Zealand context?

This practice-based research focused on understanding practice, drawing on a phronetic social science methodology (see Chapter Two; Flyvbjerg, 2001; Flyvbjerg et al., 2012; Schram, 2012; Uggerhøj, 2011). An ecological-transactional perspective (Cicchetti & Lynch, 1993; MacKenzie et al., 2011) was utilised as the theoretical framework (Chapter Two) to address the critiques of neuroscience (discussed in Chapter Three) through the consideration of broader macrosystem structures affecting children and families (Atwool, 2019; Beddoe & Joy, 2017; Green & McDermott, 2010; Munro & Musholt, 2014). The study utilised qualitative semi-structured interviews with three key informants who contributed expertise on the neurodevelopmental lens and te ao Māori (the findings from these interviews were integrated with the extant literature in Chapter Four) and 11 child protection social workers who utilise the neurodevelopmental lens (Chapter Five). The findings of this study were discussed in the preceding chapter (Chapter Six).

The findings of this study contribute to building an understanding of the neurodevelopmental lens. This research is the first Aotearoa New Zealand study to explore the views of practising child protection social workers who use the neurodevelopmental lens.[43] Research into how theory (such as the neurodevelopmental lens) is understood and applied in practice is important as it provides insight into what aspects of the theory are helpful to practitioners and can result in recommendations for improvements to the theory and practice wisdom informing child protection practice. From my own practice experience, the principles of the neurodevelopmental lens would have supported me in my practice and my work with children such as Sean (whose story was presented in Chapter One).

This final chapter focuses on reviewing the research and draws the findings together to present a model of a neurodevelopmental lens for use within Aotearoa New Zealand. Implications for child protection practice are discussed. In the first section, the key findings from the research are outlined, and a model is presented. Next, recommendations and implications for child protection practice are outlined. Then, the limitations of this current study are highlighted and recommendations for future research are presented. Finally, this thesis concludes with closing remarks.

Key findings

The study investigated how child protection social workers utilised a neurodevelopmental lens in their practice. Two themes related to how child protection social workers learnt about the neurodevelopmental lens and their perceptions on the advantages and challenges of the approach. The study identified six key themes (Chapter Five) that were important to the neurodevelopmental lens when implemented in child protection social work practice to support the understanding and addressing of the impacts of adversity. The study proposed

[43] Mason et al. (2020) explored social work students' use of the lens in the United States.

these themes as principles for the neurodevelopmental lens in child protection social work practice in Aotearoa New Zealand. As argued in Chapter Six, the six principles suggested as being important to the neurodevelopmental lens in this study were:

- Experience shapes development.
- Sequential development and intervention.
- Stress response and regulation.
- Connection and belonging.
- The therapeutic web.
- Consideration of structural factors.

These principles are interconnected and form a lens through which adversity can be understood and overcome. These principles are now briefly discussed, including how social workers utilise them to understand and address adversity (Research Questions One, Two, and Three). The final research question is addressed by describing how a model based on the neurodevelopmental lens can be used in practice to understand and address the impacts of adversity.

Experience shapes development

The principle of experience shapes development highlights that experience (both adverse and positive) impacts development (Perry, 2001, 2002, 2008, 2009). The principle was found to inform social workers' understanding of adversity through considering the child's history of adverse and protective experiences. The principle informs the neurodevelopmental lens theory of change, which is based on the understanding that the brain is plastic and malleable to change through repeated experiences (Perry, 2001, 2002, 2008, 2009). The impacts of adversity can be addressed by providing repeated experiences that activate the neural networks that are sought to be changed. This study built on the existing knowledge and practice of the neurodevelopmental lens by highlighting how child protection social workers

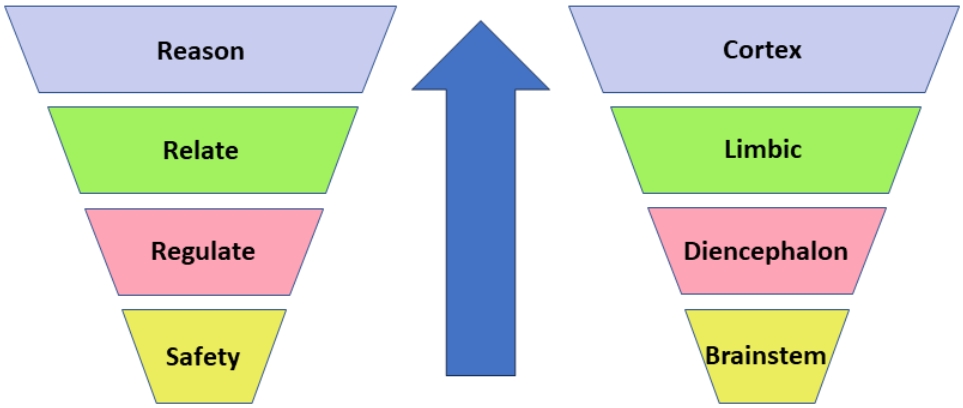
used various activities as interventions. This research found that social workers sought to identify developmentally appropriate activities to create a plan where interventions are repeated several times throughout a child's day.

Sequential development and intervention

As discussed in Chapters Four, Five, and Six, the principle of sequential development and intervention highlights that the brain develops functions sequentially from the bottom upwards, with the brain's lower regions (such as the brainstem) developing before higher regions (such as the cortex). This study found that social workers used this understanding to consider the various impacts on a child's development and current functioning. This supported a greater appreciation of the child's development capabilities and more empathetic and developmentally appropriate responses and interventions. The sequential principle informed social workers' approach to the selection of interventions and engagement with children by planning interventions sequentially from the bottom up, reflecting development. The heuristic *safety, regulate, relate, reason* was adapted in this study in Chapter Six (from Perry's regulate, relate reason; Greer, 2015, 2021; Ryan et al., 2017) to provide guidance for the sequence and selection of interventions in a developmentally appropriate manner. Each component of the heuristic (see Figure 12 below) reflects the areas of the brain as suggested by Perry (2001, 2006, 2008), and the related interventions should be approached sequentially, from the bottom up, in the same way that the brain develops.

Figure 12

The sequence of engagement and intervention heuristic and Perry's brain structure



Note: The sequence of engagement and intervention heuristic (left) and Perry's brain structure (right).

The heuristic can be applied in two ways: for engagement and intervention selection (as discussed in Chapter Six). When considered as a framework for engagement, information from the senses is quickly assessed for possible threats, activating the stress response system if a potential threat is detected. This is why **safety** is addressed first: if the child does not feel safe, this will activate their stress response system. This study extends the existing neurodevelopmental lens principle of the role of the stress response system and the role of regulation by highlighting that a sense of safety is required before regulation can occur. Social workers can achieve a sense of safety for the child through stable and predictable routines and environments by considering multiple domains of safety through models such as Maslow's (1943) hierarchy of needs. **Regulation** is the second component of the sequence. If a child is dysregulated due to activation of their stress response system, there is a need to support the child to become regulated again. Activation of the stress response system limits a person's ability to engage relationally or to access complex cortical processes (as discussed in Chapter

Four). Therefore, supporting the child to return to a state of calm becomes important (this is discussed in more detail under the principle of stress response and regulation). Once the child is calm, there is a need to engage with the child **relationally**. Relational connection needs to occur after the child is regulated as adversity is experienced relationally, and, therefore, relational interactions could be a potential source of threat (see the key finding relating to connection and belonging). Finally, **reasoning** can occur after the child is safe, regulated, and has formed a relational connection. Reasoning includes complex cortical processes such as speech-language and complex or abstract processing.

When considering the selection of interventions, the same approach is adopted, ensuring the child's safety needs and that they have a safe and predictable environment occurs first. Next, the focus should be on supporting the child's self-regulation ability. Then, therapeutic work on the child's relational attachments can occur (although there should be a constant focus on building relationships around the child, as discussed in Chapter Six). Therapeutic interventions that focus on reasoning (such as those relying on cognitive processing or speech and language) are introduced last.

Stress response and regulation

The findings of this study extend the existing knowledge and practice of the neurodevelopmental lens through proposing a principle relating to the stress response system. As discussed in Chapter Four, a key theme within the extant neurodevelopmental lens literature is the role of the stress response system and the impact of adversity on this system (Perry, 2001, 2002, 2006, 2008, 2009; Perry et al., 1995). The findings of this study highlighted the emphasis child protection social workers placed on understanding the stress response system and supporting regulation and suggested that the stress response and regulation should be a principle of the neurodevelopmental lens.

The stress response system is a protective system that has developed to protect humans from possible or actual threats to their safety (Porges, 2011; Ungar & Perry, 2012). The neurodevelopmental lens principle of the stress response system posits that repetitive or prolonged experiences of adversity can result in maladaptive changes to the stress response system (see Chapter Four for a fuller discussion of the stress response system; Perry, 2001, 2009; Porges, 2011). This can lead to children being hypersensitive or overreactive to perceived or actual threats to their safety, resulting in extreme fight, flight, or freeze responses (as discussed in Chapters Five and Six). Through this understanding, social workers reframed a child's responses and behaviour to help those working with the child to have a more empathetic response to the child.

The findings relating to this principle also provide insight into how functional challenges with the stress response system can be addressed. The principle suggests that focusing on the development of regulation capabilities is important. Regulation can be supported through somatosensory, patterned, repetitive, rhythmic activities (Fraser et al., 2017, 2019; Kilroy et al., 2019; Lane et al., 2019; Perry, 2008, 2009, 2020; Perry & Dobson, 2013; Ryan et al., 2017). Several activities (such as rocking, swinging, swimming, and kapa haka) that support regulation were suggested in this study (Chapters Five and Six). This study also found that cultural activities (especially for Māori) often include sensory components that support regulation and cultural connection. The study supported the neurodevelopmental lens' knowledge and practice of including interventions regularly throughout the day to support the child to have many opportunities for regulation. Over time, the repetition of interventions was believed to improve the child's self-regulation ability.

Connection and belonging

The knowledge and practice of the neurodevelopmental lens is focused on relationships (see Chapter Four; Perry, 2001, 2006, 2008, 2009). This research extends the existing principle of relationships through a focus on relational and cultural connection and belonging.

The findings affirmed that child protection social workers understood adversity as being experienced relationally. The participants in this study understood that both interpersonal acts (i.e., abuse) and structural factors (i.e., poverty) are experienced relationally. This was referred to as a *relational-multisystemic* understanding in Chapter Six and is discussed further in the structural factors section below. The ecological-transactional perspective served as the research's theoretical foundation, further supporting how structural inequities influence the microsystem, meaning individuals experience adversity relationally (Belsky, 1980; Cicchetti & Lynch, 1993). The previous chapter also discussed how the participants understood relational templates which acted as a lens through which all interpersonal interactions are filtered and shaped by past relational experiences. Many of the participants' understanding of the neurodevelopmental lens was informed by attachment theory. The findings suggested that social workers understood early caregiver relationships form a blueprint for future social and emotional functioning (Ainsworth et al., 1978; Bowlby, 1958). The study highlighted how social workers leveraged the neurodevelopmental lens to interpret and respond to children's behaviours empathetically through recognising behaviour as an adaptation to their history of experiences (Carriere & Richardson, 2013).

The research found that there were relational impacts of adversity. An important contribution to the neurodevelopmental lens' knowledge and practice was the finding that adversity often results in a sense of disconnection due to changes in the child's relationships. Building a sense of connection and belonging for the child was a significant focus of the participants and they sought to do this through supporting and strengthening multiple relationships. This is particularly relevant in collective cultures, like Māori and Pacific people groups, where there is a focus on interconnectedness and the collective raising of children (Granqvist et al., 2017; Pihama et al., 2021).

A connection to culture was a priority for social workers using a neurodevelopmental lens. A cultural worldview was found in this study to be an important part of identity and how we

relate to and understand the world (Fylkenses et al., 2021). This is particularly important within the Aotearoa New Zealand context where the colonisation of Māori has resulted in intergenerational impacts and disconnection from culture and whenua (Fitzmaurice-Brown, 2022; Pihama et al., 2021; Pihama et al., 2014; Pihama et al., 2019; Pihama et al., 2020). This study highlighted the importance of social workers considering the impacts of cultural disconnection as a form of adversity. Furthermore, it argued that the development of cultural connections occurs through experiences, with the child's family playing a central role in supporting the child's connection to their culture. Social workers enable, encourage, and support cultural connections and activities. This study, therefore, located culture as a central component of the neurodevelopmental lens, which further deepens the neurodevelopmental lens' knowledge and practice.

Therapeutic web

Social workers play an important role in navigating, unifying, and supporting the multiple systems surrounding a child and their family to strengthen connection and belonging. Creating a therapeutic web (a network of the child's family and those working with the child and their family) was found to result in holistic, coordinated, and collaborative planning and intervention. This study builds on the existing understanding of the therapeutic web within the literature relating to the NMT through providing insights into how social workers viewed and utilised the therapeutic web within their practice (Perry, 2020; Perry & Dobson, 2013).

The research (Chapter Six) highlighted that the concept of a therapeutic web could be strengthened through the inclusion of the principles of a wraparound approach (Bruns & Walker, 2015; Perry & Dobson, 2013). Utilising a structured approach where regular communication between the therapeutic web can occur ensures there is empowerment and collaboration when working with children (and their families) who have experienced adversity. This supports a shared understanding of the child's history and current strengths and challenges and ensures cohesive planning across the various systems with which a child

is involved. The study findings indicated that healing occurs when regulating and integrating activities and interventions across the various microsystems (Perry, 2020).

The study acknowledged the complexity of interdisciplinary collaboration, where differing professional perspectives (especially between education, mental health, and social work) can pose challenges. Addressing these challenges was found to be achieved through developing a shared understanding of the child's history to ensure accurate assessment, support, and intervention planning. This approach was considered in this study to be particularly pertinent in navigating the intricacies of diagnoses like ADHD in children with trauma histories (Boodoo et al., 2022; Hunt, 2020).

Structural factors

Chapter Four established that the neurodevelopmental lens does not currently include a focus on the structural factors (such as poverty or colonisation) which may be affecting a child and their family. Critics of the use of neuroscience within social work practice have argued that it can result in an individualistic focus, which misses the structural causes of adversity (as discussed in Chapter Three; Beddoe & Joy, 2017; Green & Goodman, 2010; Joy, 2022; Plafky, 2016; Wastell & White, 2012). This study addressed these critiques by proposing a *relational-multisystemic* understanding in Chapter Six to explain how structural factors affect the various levels of the ecological system, resulting in increased levels of stress in relationships and difficulty in meeting the child's developmental needs. Joy (2022) described this as being a *both/and* positioning, whereby social workers focused on the immediate needs of the individual whilst also challenging structures. Whilst the focus on structural factors is not currently an established principle of the neurodevelopmental lens, this research argued that it is an important consideration when working with families and should be included as a principle when the lens is used in child protection social work practice. By including a structural focus, the often-hidden forms of structural adversity may be identified and addressed, alongside the recognition that children may be experiencing these relationally. The

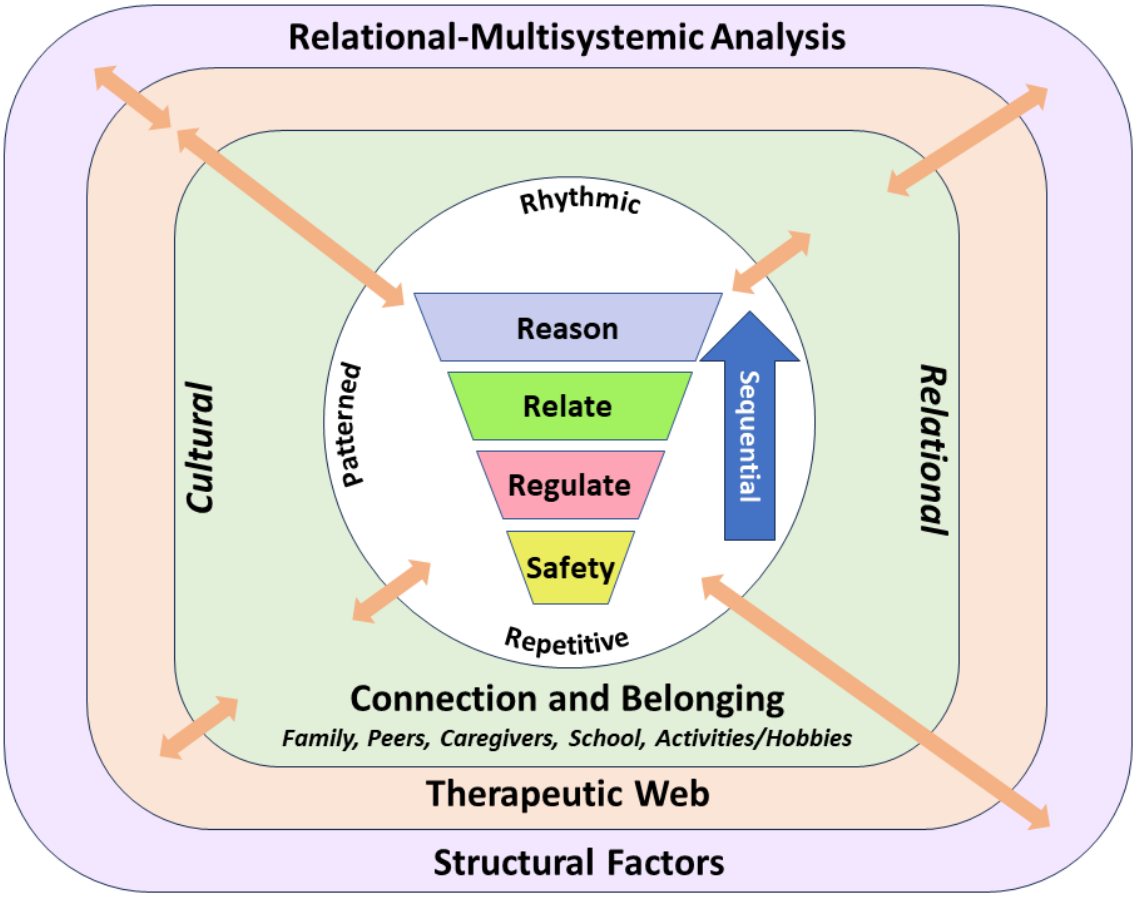
inclusion of a structural focus also ensures the approach has greater alignment with the profession of social work (IFSW & IASSW, 2014; Ornellas et al., 2016). This is an important finding which may further strengthen the use of the neurodevelopmental lens within child protection social work practice.

The neurodevelopmental lens model

Figure 13 (on the next page) presents an Aotearoa New Zealand model, introduced in the discussion chapter, which builds on the neurodevelopmental lens principles and has emerged out of this study. The model integrates the principles of the neurodevelopmental lens and considers a child's context and structural factors. The white circle in the centre represents the child. Located within the individual is a reminder of Perry's structure of the brain with the sequence of engagement heuristic in the centre. The upwards arrow serves as a reminder about sequential development and intervention. The words *rhythmic, repetitive,* and *patterned* are included within the circle as a reminder of the types of interventions which support the development of regulation.

Figure 13

The neurodevelopmental lens model



The model reflects an ecological-transactional perspective with the child being located at the centre. The orange arrows represent the interactions (experiences) between the child and the respective levels of the ecological system, and the bi-directional interactions between the various system levels. The child is surrounded by their relational connections (microsystem). The child's cultural connection and belonging are also located within this immediate sphere surrounding the child, as culture is the lens through which individuals engage and interpret the world around them (as argued by Krakouer et al., 2018). Located within the microsystems (the green) is a reminder to build both relational and cultural connection and belonging, along with a reminder of the different settings where connection and belonging can be realised. The therapeutic web (peach) represents the network of relationships across the systems with which a child engages (the mesosystem). Finally, structural factors are located on the outside (the

macrosystem – purple). The model can be used to guide an understanding of adversity and as a framework to address the impacts of adversity. The next section discusses recommendations and implications for practice.

Recommendations and implications for practice

This research contextualises the neurodevelopmental lens in the Aotearoa New Zealand social work context and makes a contribution to the knowledge, understanding, and practice of professional child protection social work. It provides a framework for child protection practitioners to be able to understand and address the impacts of adversity. The neurodevelopmental lens is a possible framework for use in child protection social work practice to support improved outcomes for children who have experienced adversity. This research investigated the neurodevelopmental lens in a child protection social work context, resulting in proposed changes to the extant principles and the inclusion of the consideration of structural factors to ensure greater alignment with social work theory, knowledge, and practice. The findings of this study suggest that some social workers are already using the principles of the neurodevelopmental lens successfully in their practice (Chapter Five).

As discussed in Chapter Three, critics of neuroscience have cautioned against the uncritical adoption of neuroscientific knowledge within social work practice (Beddoe & Joy, 2017; Joy, 2022; Munro & Musholt, 2014; Wastell & White, 2012). These critiques can be overcome through the integration of neuroscience within an ecological framework and alignment with social work values, focusing on relational practice and social justice (Gibson, 2021), as proposed in this study. This adapted framework has implications for child protection social work practice as it may result in improved outcomes for children who are recovering from experiences of adversity. The findings from this research highlight the important role social workers play in working with and coordinating the multiple levels of the ecological system

surrounding the child to develop and implement a package of therapeutic care which supports the child to heal from their experiences of adversity.

Any social work theory must be used in a critically reflective manner. This remains true with the implementation of the neurodevelopmental lens. The uncritical use of the lens could have unintended consequences. For example, Keddell (2017a) found that social workers who emphasised the developmental impacts of trauma were more likely to recommend a child be removed from their parents' care. There is a risk an approach such as the neurodevelopmental lens would increase the risk of removal as practitioners may become hyperaware of the impact of adversity on children, leading to increased risk averse practice. These risks can be mitigated through organisation implementation, training, and supervision.

Organisational implementation

Effective organisational implementation and support for the neurodevelopmental lens are likely to support improved outcomes for children who have experienced adversity. In Chapter Five, the participants identified that the approach was not effectively implemented within organisations. Successful implementation of the lens would include ensuring there are appropriate support and enablers for the approach. This can include appropriate workloads, resources, and time available to practice in this way. Furthermore, aligning organisational templates (such as assessment and referral templates) with the approach would further support its implementation. It is important that there is practice support available for practitioners and having experts who can provide a consultative role or work alongside practitioners in challenging cases may be of benefit. This means that different roles within the organisation are likely to require different levels of knowledge, and therefore organisational implementation plans should include ongoing training and professional development.

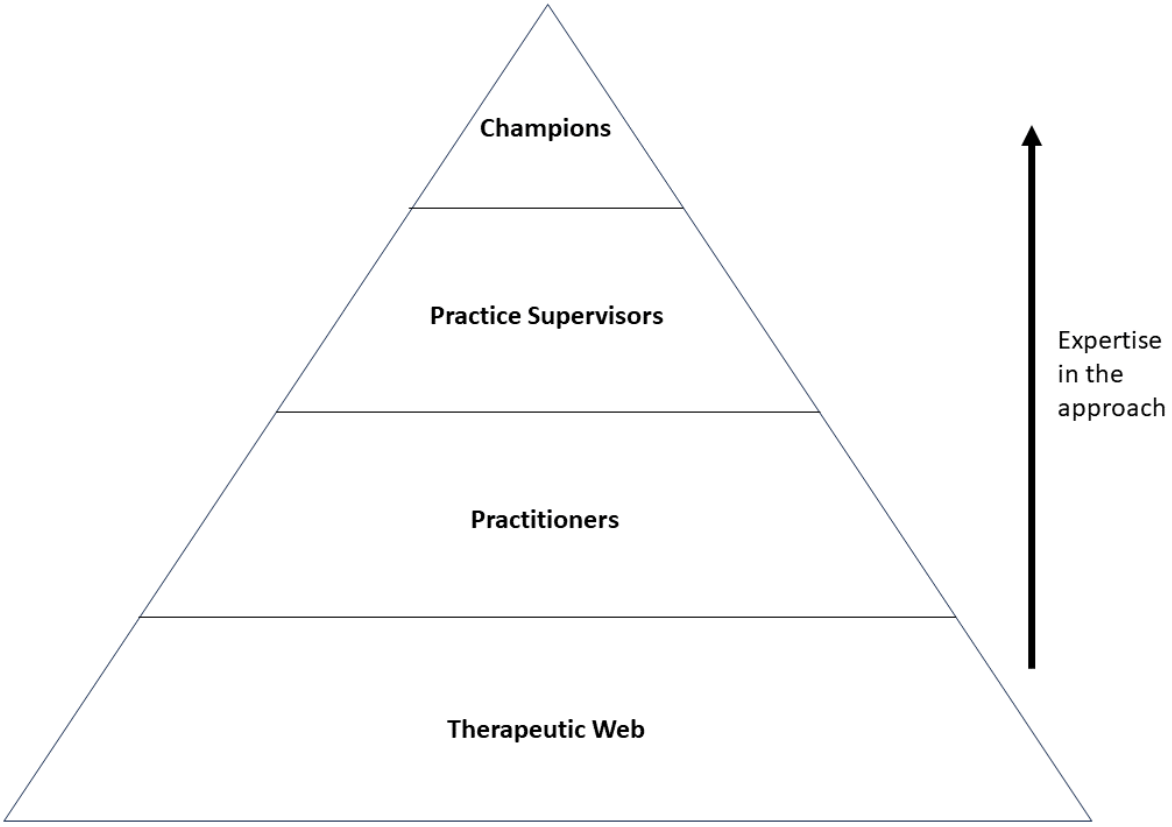
Training

Training programmes based on the neurodevelopmental lens could support social workers' understanding of the approach. The participants learnt about the lens through a variety of mechanisms – from their own study through to formal training in the NMT. In Chapter Five, the participants noted there is a need for access to training in the approach to embed it in practice. The provision of training packages (both as induction for new staff and ongoing regular professional development) in the neurodevelopmental lens might further support effective organisational implementation.

Figure 14 (located on the next page) proposes four levels of training to support the implementation of the approach. The triangle represents the number of people at each level which decreases as the level of training. The therapeutic web (including teachers and parents) is included so they can be supported to learn about the core concepts of the approach. The social worker may lead this process by explaining the core principles of the neurodevelopmental lens and how this informs their work. This will help build a shared understanding, increase empathetic responses to the child, and ensure that there is a cohesive plan implemented across the various systems surrounding the child (as discussed in Chapter Six). The implementation of training would require financial support from organisations, and this is likely to require investment from government funders due to many organisations being underfunded for training. Practice supervisors would also need to have knowledge of the approach and be able to lead supervision in a manner that supports critical reflection and analysis to ensure the neurodevelopmental lens is implemented in a safe manner. Finally, champions in the neurodevelopmental lens could have additional training about the model and provide practice leadership and consultation to other social workers.

Figure 14

Levels of training to support knowledge in the neurodevelopmental lens



Different levels of training and expertise within the neurodevelopmental approach may support and embed learning. This is important as those with a greater level of understanding can provide consultative support and advice to lower levels. For example, having champions who have undergone more training in the approach means they can mentor, coach, and work alongside those with less experience, or work with more complex cases.

In Chapter Five, the participants discussed the need for the inclusion of the neurodevelopmental lens in social work education. Undergraduate social work students could be introduced to the high-level principles of the neurodevelopmental lens in child protection papers and/or courses, and deeper knowledge of the approach could be provided through postgraduate papers. The inclusion of additional course material may introduce social work

students to an important framework for how they can understand and address the impacts of adversity. This would address the findings in this study and the calls from some social work students in Aotearoa New Zealand for a greater inclusion of learning about trauma in social work education (Beddoe et al., 2019). Principles of the neurodevelopmental lens have been included in a Master of Social Work course in the United States, with the student participants finding this knowledge provided a valuable framework to organise their work with children who have experienced adversity (Mason et al., 2020). It is important that social work students have the necessary skills and knowledge to be able to work effectively with children to address adversity when they commence practice. Overall, the findings of this study and those of Mason et al. (2020) support the introduction to the neurodevelopmental lens within social work education in Aotearoa New Zealand.

Supervision

In Chapter Five, the participants of this study highlighted that supervision was one way in which they ensured their practice was safe. Supervision is an important aspect of social work practice as it supports critical reflection and should be a key mechanism through which social workers explore the integration of theory into practice (Beddoe & Davys, 2010; Karvinen-Niinikoski et al., 2019; Oates, 2022). It is important that social work supervision is utilised to ensure that there is critical application of the neurodevelopmental lens to practice. Effective supervision can contribute towards ensuring that the neurodevelopmental lens is critically integrated into social work practice, locating it within the social justice, human rights, and structural considerations of the profession (Joy, 2022).

Additionally, attending to the personal well-being of the social worker is a core focus of supervision. Social workers working under the neurodevelopmental lens are exposed to trauma and abuse and this work can have a negative impact, resulting in vicarious trauma, secondary trauma, and burnout (Dyer & Chisnell, 2023; Oates, 2022; Virtue & Fouché, 2010). While it is outside of the scope of this thesis, other studies have considered the important role

supervision can play as one form of support for social workers to mitigate the impacts of this work (Dyer & Chisnell, 2023; Virtue & Fouché, 2010). Drawing on the principles of TIP, Oates (2022) proposed a Trauma-Informed Supervision and Support (TISS) framework to guide supervision practice. Oates adopted a holistic approach (considering the different roles of practitioners, supervisors, organisations, and the local context in supervision) in supporting the well-being of practitioners. The TISS framework may be an appropriate framework to utilise and adapt for social workers using the neurodevelopmental lens.

Limitations of the research

Chapter Two discusses the methodological limitations of this research. Whilst this research contributes to the extant understanding of the neurodevelopmental lens knowledge and practice, several limitations of the research need to be identified. Qualitative and practice research does not seek to be generalised; instead, the research methodology seeks to produce rich descriptions of experience, knowledge, and practice (Denzien & Lincoln, 2017; Flyvbjerg, 2001; Flyvbjerg et al., 2012; Schram, 2012; Uggerhøj, 2011). As such, the findings of this study are intended to inform the knowledge and practice of the neurodevelopmental lens but may not be directly transferrable to other settings. This is apparent in several key areas.

Firstly, this study interviewed key informants and child protection social workers in Aotearoa New Zealand and sought to understand how they described applying the neurodevelopmental lens in their practice. The findings of this research reflect the Aotearoa New Zealand context where the research was conducted and may not be directly applicable to other contexts. Secondly, this study only presents social workers' perspectives on the efficacy and applicability of the neurodevelopmental lens to practice. While this is an important contribution to the knowledge of how social workers understand and utilise the neurodevelopmental lens in practice, the literature would be further strengthened through future research which triangulates the experiences of children and families, observations of practice, and evaluative

research into the efficacy of the approach. Further research in proximately similar settings could also be beneficial (Polit & Beck, 2010).

Furthermore, the current study is limited by statutory child protection social workers not being able to participate in the research. Instead, social workers working in the wider child protection system in NGOs participated in this research. Therefore, the findings may not be directly transferrable to statutory child protection social work. It is recommended that further research with statutory social workers is undertaken.

Recommendations for future research

The neurodevelopmental lens is an emerging approach and there is somewhat limited research into its efficacy and understanding. This study contributes to the extant knowledge and practice through exploring how child protection social workers utilise the neurodevelopmental lens in their practice to understand and address the impacts of adversity. As this is an emerging framework, a plethora of future research could be completed. Some suggestions for areas of future research include:

- Exploring the experiences of children and their families of social work practice using a neurodevelopmental lens and how they participated in intervention planning. A rights-based narrative approach to research with children and young people is recommended (McNamara, 2011).
- Longitudinal research into the outcomes of the neurodevelopmental lens.
- Evaluations of the effectiveness of the neurodevelopmental lens, including what aspects of the lens are most effective at supporting change.
- Comparing the efficacy of the neurodevelopmental lens to other practice approaches, such as trauma-informed approaches in a randomised controlled study.
- Exploring further the efficacy of sensory-based interventions within the child protection population.

- Replicating the research with child protection social workers currently working in statutory positions to ensure the lens is applicable in statutory organisations.
- Exploring the alignment between a neurodevelopmental lens and te ao Māori, using kaupapa Māori research methods.
- Considering if the neurodevelopment lens could be used with other population groups, including adults with a history of adversity or mental health challenges.
- International research to explore further the intersection between culture, connection and belonging, and the neurodevelopmental lens in different contexts.
- Understanding how child protection social workers can challenge and address structural forms of adversity when using the neurodevelopmental lens.

Closing remarks

This research investigated how child protection social workers used a neurodevelopmental lens to understand and address adversity. The study expanded existing and introduced new principles of the neurodevelopmental lens for child protection social work practice. It was found that examining the impact of structural factors within the neurodevelopmental lens ensures that broader forms of structural adversity can be considered and addressed. Adversity has long-lasting impacts on children and families, which contributes to the complexity of child protection social work. Child protection social workers play an important role in understanding and addressing adversity and they need to have the knowledge, skills, and experiences to effectively work with children and families. The neurodevelopmental lens provides a valuable framework and guidance for child protection social workers in their practice as they seek to understand and address adversity. I hope this research will make a contribution to professional child protection social work practice, knowledge, and understanding and improve outcomes for children and young people (and their families) who have experienced adversity, such as Sean.

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Appendices

Appendix A: Key informant information sheet

MASSEY UNIVERSITY
COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work

KEY INFORMANT INFORMATION SHEET

Kia ora, my name is Braden Clark and I am completing my Doctor of Social Work through Massey University. I am undertaking research to explore how social workers understand and address the impacts of childhood adversity by using a neurodevelopmental lens. The neurodevelopmental lens is an emerging approach contributing to practitioners understanding of how childhood adversity affects children and their selection of appropriate interventions.

I would like to invite you to participate in my research as a key informant as you have specialised knowledge that I believe is relevant to my topic.

The research uses a qualitative methodology, and should you wish to participate, you will be invited to have two individual interviews with me. The research aims to answer the following questions:

1. What principles do child protection social workers view as being important to the neurodevelopmental perspective?
2. How do child protection social workers use the principles of neurodevelopment to understand the impact of childhood adversity on their clients?
3. How do child protection social workers use the principles of neurodevelopment to inform their subsequent intervention planning?
4. How could a model based on a neurodevelopmental perspective, such as Perry's Neurosequential Model of Therapeutics, be utilised in the NZ context?

Participation in the research will involve two interviews of approximately 60 to 90 minutes each. Time for initial contact and reviewing of interview transcripts will take approximately an hour.

I am approaching 3-4 key informants who hold specialised knowledge related to the research topic. I believe you have knowledge in:

- Neurodevelopment and/or
- Māori and/or Pacific cultural knowledge (within the care and protection area).

In addition to using key informant interviews, I am going to interview 10-12 social workers, that meet the following criteria:

- Are a registered social worker;
- Have familiarity with the care and protection system;
- Have at least three years' experience working with children; and
- Have an interest in how child development and neurodevelopment is affected by trauma, maltreatment, and abuse.

As a key informant, I would like to have two interviews with you. The first will be prior to any interviews with social workers and your knowledge will be used to inform the research questions. The second will be following data collection and analysis to support me to contextualise the findings to the Aotearoa New Zealand context and to ensure the research is culturally appropriate and relevant. You will also be invited to communicate via email with me throughout the research in order to answer questions or provide further advice should the need arise.

I do not expect that participation in the research will cause any harm or discomfort, however, due to the nature of discussing child abuse, trauma, and abuse, there is the potential for you to have an emotional

reaction or become upset. If this were to occur, I would ensure you were supported to access appropriate support.

Data use and storage
I will ensure that all information you give me, including the consent form and the interview recording and transcript, will be kept in a secure location that is not accessible to anyone other than me. Electronic data will be stored on my password protected Massey University OneDrive. If email is used to share information, I cannot guarantee its confidentiality as it will not be encrypted.

The data from the project may be used in publications and presentations. You will receive a copy of the summary of the findings. You will also be able to have a copy of your audio recording and your interview transcript if you wish. Data will be retained until all interest in the project has been completed but for a minimum of six years following the completion of the research.

Confidentiality
To ensure your privacy and confidentiality, pseudonyms will be used in research publications and any identifying details will be changed. Whilst identifying details will be changed, there is a chance that people may be able to link you to the study based on what you have said. All practical steps will be taken to protect you and your identity.

Rights for participants
You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study until you have signed the release of transcript form;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded;
- ask for the recorder to be turned off at any time during the interview.

If you are interested in being a key informant within my study, or have any questions or concerns about this project, please contact myself or my supervisors, Dr Nicky Stanley-Clarke and Professor Robyn Munford. Thank you for considering participating in this project. I look forward to hearing from you.

Ngā mihi nui,

Braden Clark

Researcher	**Supervisors**
Braden Clark Braden.Clark.1@uni.massey.ac.nz [redacted]	Dr Nicky Stanley-Clarke (Primary) N.Stanley-Clarke@massey.ac.nz 06 356 9099 x 83515 Professor Robyn Munford R.Munford@massey.ac.nz 06 356 9099 x 83513

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named above are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Prof Craig Johnson, Director, Research Ethics, telephone 06 356 9099 x 85271, email humanethics@massey.ac.nz

Appendix B: Participant information sheet

MASSEY UNIVERSITY
COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work

PARTICIPANT INFORMATION SHEET

Kia ora, my name is Braden Clark and I am completing my Doctor of Social Work through Massey University. I am undertaking research to explore how social workers understand and address the impacts of childhood adversity by using a neurodevelopmental lens. The neurodevelopmental lens is an emerging approach contributing to practitioners' understanding of how childhood adversity affects children and their selection of appropriate interventions. The neurodevelopmental lens uses principles of brain development in order to understand how a child's experiences are affecting them and their current functioning and provides guidance on the selection and implementation of interventions.

I would like to invite you to participate in my research to explore how you use a neurodevelopmental lens in your practice.

The research uses a qualitative methodology. Interviews with key informants have already occurred to provide background to the research and inform this phase of the study. Should you wish to participate, you will be invited to have an individual interview with me. The research aims to answer the following questions:

1. What principles do child protection social workers view as being important to the neurodevelopmental perspective?
2. How do child protection social workers use the principles of neurodevelopment to understand the impact of childhood adversity on their clients?
3. How do child protection social workers use the principles of neurodevelopment to inform their subsequent intervention planning?
4. How could a model based on a neurodevelopmental perspective, such as Perry's Neurosequential Model of Therapeutics, be utilised in the NZ context?

Participation in the research will involve an interview of approximately 60 to 90 minutes. Time for initial contact and reviewing of the interview transcript will take approximately 30 minutes.

I am intending to interview 10-12 social workers, that meet the following criteria:

- Are a registered social worker;
- Have familiarity with the care and protection system but not currently be employed at Oranga Tamariki;
- Have at least three years' experience working with children; and
- Have an interest in how child development and neurodevelopment is affected by trauma, maltreatment, and abuse.

I do not expect that participation in the research will cause any harm or discomfort, however, due to the nature of discussing child abuse, trauma, and abuse, there is the potential for you to have an emotional reaction or become upset. If this were to occur, I would ensure you were supported to access appropriate support.

Data use and storage
I will ensure that all information you give me, including the consent form and the interview recording and transcript, will be kept in a secure location that is not accessible to anyone other than me. Electronic data will be stored on my password protected Massey University OneDrive. If email is used to share information, I cannot guarantee its confidentiality as it will not be encrypted.

Confidentiality
To ensure your privacy and confidentiality, pseudonyms will be used in research publications and any identifying details will be changed. The type of organisation you work for may be disclosed (i.e. statutory agency or non-governmental organisation) if it helps to contextualise the findings. Whilst personal identifying details will be changed, there is a chance that people may be able to link you to the study based on what you have said. All practical steps will be taken to protect you and your identity.

Rights for participants
You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study at any time before you have signed the release of transcript form;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded;
- ask for the recorder to be turned off at any time during the interview.

If you are interested in being a participant within my study, or have any questions or concerns about this project, please contact myself or my supervisors, Dr Nicky Stanley-Clarke and Professor Robyn Munford. Thank you for considering participating in this project. I look forward to hearing from you.

Ngā mihi nui,

Braden Clark

Researcher	**Supervisors**
Braden Clark Braden.Clark.1@uni.massey.ac.nz [redacted]	Dr Nicky Stanley-Clarke (Primary) N.Stanley-Clarke@massey.ac.nz 06 356 9099 x 83515 Professor Robyn Munford R.Munford@massey.ac.nz 06 356 9099 x 83513

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 20/04. If you have any concerns about the conduct of this research, please contact Dr Negar Partow, Chair, Massey University Human Ethics Committee: Southern A, telephone 04 801 5799 x 63363, email humanethicsoutha@massey.ac.nz.

Appendix C: Key informant interview schedule

Discuss participant's rights and the information sheet. Ask if the participant has any questions. Reiterate confidentiality principles. Seek consent to proceed.

Demographic details for participant:

- Qualifications
- Background and experience in the field

NEURODEVELOPMENTAL EXPERTISE

1. What is your experience with the neurodevelopmental lens?
    a. What has drawn you to use this approach?
    b. What do you think are some key principles of a neurodevelopmental lens?
2. When working with your clients, how does the neurodevelopmental lens inform your work?
3. How do you think that experiences such as poverty or social disadvantage (such as being a minority ethnic group) impact a child's development?
4. How do you make sense of a child's experiences, such as abuse and trauma, and the way in which they are presenting?
5. What factors do you think help children to do well despite adverse experiences?
6. When you think a child has been impacted by childhood adversity or trauma, how do you help them to overcome this? How does a neurodevelopmental lens inform this practice?
7. What principles of a neurodevelopmental lens do you use to inform your intervention planning for children in care?
    a. How can the neurodevelopmental lens be applied for children with disabilities?
8. From a te ao Māori perspective, what do Pakeha need to be aware of in order to make the model appropriate for Māori?

    a. How have you seen a neurodevelopemental lens being applied well with Māori?
    b. What can go wrong with the application of a neurodevelopmental lens for Māori and other cultural groups?
9. How do you get support for working in this way?
10. In your view, are there any questions that I should be asking participants?

MĀORI CULTURAL KNOWLEDGE (this section is for key informants who are Māori only)

1. How do Māori understand concepts of neurodevelopment and/or childhood development?
    a. How does a neurodevelopmental approach fit within a Māori cultural framework?
2. How do Māori understand the concept of adversity? How does this impact on the individual, whānau, hapū and iwi?
    a. How do Māori understand the impacts of intergenerational trauma?
3. What do you believe are important factors to helping children overcome experiences of trauma?
    a. How might traditional approaches of Māori healing help children overcome these experiences?
4. How might one bring together knowledge of neuroscience and neurodevelopment with a te ao Māori worldview?
5. What do you know about Te Waka Oranga (Traumatic Brain Injury model)?
    a. Could this (or a similar approach) be used to address the neurodevelopmental impacts of trauma for children in care?
    b. How might this happen?
6. How do I ensure that the findings of this research are applicable for Māori given that the majority of children in the child protection system are Māori?

7. What advice do you have about engaging with Māori social workers for research?
8. In your view, are there any questions that I should be asking participants?

CLOSING

- Is there anything else that you would like to share with me about the topic that we have not discussed yet?
- Do you have any final thoughts?

Thank you for participating in interview. Next steps include:

- Transcribing the interviews. You will be sent a copy for checking and a form to sign for release of the transcript.
- As indicated on the information sheet, I may contact you via email with further questions or seeking advice or recommendations should anything arise during the research.

Appendix D: Participant interview schedule

Discuss participants rights, the information sheet. Ask if the participant has any questions. Reiterate confidentiality principles. Seek consent to proceed.

Undertake whakawhanaungatanga process (building connections).

Demographic details for participant

- Qualifications
- Background and experience in the field including experience of the neurodevelopmental lens.

GENERAL TOPICS

1. What is your experience with the neurodevelopmental lens?
    a. What has drawn you to use this approach?
    b. What are some key principles of a neurodevelopmental lens?
2. When working with your clients, how does the neurodevelopmental lens inform your work?
3. How do you think that experiences such as poverty, or social disadvantage (such as being a minority ethnic group) impact on a child's development?
4. How do you make sense of a child's experiences, such as abuse and trauma, and the way in which they are presenting?
5. What factors do you think help children to do well, despite adverse experiences?
6. When you think a child has been impacted by childhood adversity or trauma, how do you help them to overcome this? How does a neurodevelopmental lens inform this practice?
7. What principles of a neurodevelopmental lens do you use to inform your intervention planning for children in care?
    a. How can the neurodevelopmental lens be applied for children with disabilities?

8. Have you used a neurodevelopmental perspective with Māori clients? Can you tell me about how you did this without disclosing specific details of the case?
    a. How did you ensure your work was culturally competent?
9. From a te ao Māori perspective, what do Pakeha need to be aware of in order to make the model appropriate for Māori?
    a. How have you seen a neurodevelopemental lens being applied well with Māori?
    b. What can go wrong with the application of a neurodevelopmental lens for Māori and other cultural groups?
10. How do you get support for working in this way? How does supervision help you work in this way?

CLOSING

- Is there anything else you would like to share with me about the topic we have not discussed yet?
- Do you have any final thoughts?

Thank you for participating in the interview. Next steps include:

- Transcribing the interviews. You will be sent a copy for checking and a form to sign for release of the transcript.
- Sent a summary of findings.

Appendix E: Key informant consent form

MASSEY UNIVERSITY
COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work

KEY INFORMANT CONSENT FORM

I have read, or have had read to me, and I understand the information provided in the attached Information Sheet. I have had the details of the study explained to me, any questions I had have been answered to my satisfaction, and I understand that I may ask further questions at any time. I have been given sufficient time to consider whether to participate in this study and I understand participation is voluntary and that I may withdraw from the study until I have signed authority for the release of transcripts form.

1. I agree/do not agree to the interview being sound recorded.
2. I agree/do not agree to be contacted via email between interviews to answer questions and/o to provide advice or clarification for the researcher.
3. I agree to participate in this study under the conditions set out in the Information Sheet.

Declaration by Participant:

I _____ (print full name) hereby consent to take part in this study.

Signature: _____ Date: _____

Te Kunenga ki Pūrehuroa

School of Social Work
Private Bag 11 222, Palmerston North, New Zealand **T** +64 6 356 9099 **www.massey.ac.nz**

Appendix F: Participant consent form

MASSEY UNIVERSITY
COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work

PARTICIPANT CONSENT FORM

I have read, or have had read to me, and I understand the information provided in the attached Information Sheet. I have had the details of the study explained to me, any questions I had have been answered to my satisfaction, and I understand that I may ask further questions at any time. I have been given sufficient time to consider whether to participate in this study and I understand participation is voluntary and that I may withdraw from the study at any time before I have signed the release of transcript form.

1. I agree/do not agree to the interview being sound recorded.
2. I agree to participate in this study under the conditions set out in the Information Sheet.

Declaration by Participant:

I _____ (print full name) hereby consent to take part in this study.

Signature: _____ Date: _____

Te Kunenga ki Pūrehuroa

School of Social Work
Private Bag 11 222, Palmerston North, New Zealand **T** +64 6 356 9099 **www.massey.ac.nz**

Appendix G: Release of transcript authority form

MASSEY UNIVERSITY
COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work

AUTHORITY FOR THE RELEASE OF TRANSCRIPTS

I confirm that I have had the opportunity to read and amend the transcript of the interview(s) conducted with me.

I agree that the edited transcript and extracts from this may be used in reports, publications and presentations arising from the research.

Signature: ..... **Date:** .....

Full Name - printed .....

Te Kunenga ki Pūrehuroa

School of Social Work
Private Bag 11 222, Palmerston North, New Zealand **T** +64 6 356 9099 **www.massey.ac.nz**

Appendix H: Low risk ethics notification

Date: 21 December 2019

Dear Braden Clark

Re: Ethics Notification - **4000022075** - **Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work**

Thank you for your notification which you have assessed as Low Risk.

Your project has been recorded in our system which is reported in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

If situations subsequently occur which cause you to reconsider your ethical analysis, please contact a Research Ethics Administrator.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:
"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director - Ethics, telephone 06 3569099 ext 85271, email humanethics@massey.ac.nz."

Please note, if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to complete the application form again, answering "yes" to the publication question to provide more information for one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

Yours sincerely

Research Ethics Office, Research and Enterprise
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand **T** 06 350 5573; 06 350 5575 **F** 06 355 7973
E humanethics@massey.ac.nz **W** http://humanethics.massey.ac.nz

Human Ethics Low Risk notification

Professor Craig Johnson
Chair. Human Ethics Chairs' Committee and Director (Research Ethics)

Research Ethics Office, Research and Enterprise
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand **T** 06 350 5573; 06 350 5575 **F** 06 355 7973
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Appendix I: Ethical approval letter

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Date: 16 April 2020

Dear Braden Clark

Re: Ethics Notification - **SOA 20/04** - **Understanding and addressing childhood adversity through a neurodevelopmental lens in child protection social work**

Thank you for the above application that was considered by the Massey University Human Ethics Committee: **Human Ethics Southern A Committee** at their meeting held on **Thursday, 16 April, 2020**.

Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Professor Craig Johnson
Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

Research Ethics Office, Research and Enterprise
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand **T** 06 350 5573; 06 350 5575 **F** 06 355 7973
E humanethics@massey.ac.nz **W** http://humanethics.massey.ac.nz

Appendix J: Prompt questions for the neurodevelopmental lens model

Principle	Understanding adversity	Addressing adversity
Sequential development and adversity	• What are the areas of functional challenges for the child? • How may have the timing of the child's adversity impacted the development of their brain?	• How is the *safety, regulate, relate, and reason heuristic* utilised? • What is the lowest region of the brain's functions requiring intervention? • How is the therapeutic web working in a bottom-up, developmentally appropriate manner?
Experiences	• What is the child's history of adversity and protection from adversity?	• What developmentally appropriate therapeutic activities are needed to be patterned and repeated regularly to target the areas needing functional improvements? • How can the child's strengths and interests be utilised in intervention planning?
Regulate	• What is the child's response to stress? • What does the child naturally do to self-regulate? • What is currently in place to support the child in regulating their emotions regularly?	• What patterned, repetitive, rhythmic, somatosensory activities can be implemented regularly throughout the child's day to support regulation?
Connection and belonging	• How strongly does the child feel a sense of connection and belonging? • What is the child's history of relational connections? • Who does the child currently have relational connections with? What is the quality of this connection? • How strongly does the child feel a sense of connection and belonging with their culture?	• What can be done to support the child's sense of connection and belonging? • How can the child's current relational connections be supported and strengthened? • Who else could the child form a relationship with? • What is the plan to support and give the child a sense of connection and belonging with their culture?
Therapeutic Web	• Who is involved with the child and could be part of the therapeutic web?	• Who else needs to be part of the therapeutic web?
Structural factors	• What structural factors affect this child, family, and micro- and meso-systems? • How does the child experience these relationally?	• What can be done to alleviate or challenge the structural adversities?