Emerging Adults' Perceptions of their Family Systems:

Resilience and Connections After the COVID-19 Pandemic

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Abstract

Background: Family systems can be conceptualized as complex adaptive systems consisting of intricate interconnections among family members that adapt dynamically to the environment. The COVID-19 pandemic was a chronic and persistent trauma to many systems including families. Family resilience, an ongoing process of the system that helps the family adapt to changes and find an improved level of functioning, may have contributed to how families are faring after the COVID-19 lockdown period. **Purpose:** This study focused on family resilience as a possible moderator between COVID-19-related changes and family satisfaction, and how structural dynamics of family connections can affect family resilience. **Methods:** $N = 149$ emerging adults ages 18-29 in Thunder Bay, Ontario, completed an online survey regarding their family of origin, responding as a child within the family system. Various scales assessed the number of COVID-19 stressors, COVID-19 impacts on the family, family resilience, family satisfaction, and the frequency of connections with each family member. **Results:** The first aim of this study sought evidence for a moderation of family resilience on COVID-19 impacts and family satisfaction, but the high correlation between family resilience and family satisfaction impeded further analyses. The second aim, a post-hoc exploratory analysis on the effects of individual family members' connections on family resilience, found a myriad of significant results for which to base future research. **Conclusions:** A proper conceptual design to study family resilience as a process without being a variable in the study is necessary. Future research can investigate various dyadic family connections as a predictor of family resilience.

Key terms: family systems, complex adaptive systems theory, family resilience, family connections, COVID-19

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Families are one of the first foundational systems in an individual's life. They play a significant role in influencing individual development, coping mechanisms, and relationships. Families possess intricate patterns, mechanisms, and processes that extend beyond the members themselves. Each family system is unique due to its composition, overall structure, contextual environment, and objective experiences. Families come in diverse forms, and a systems perspective helps to unify complex behaviours and patterns into a theoretical model. Thus, although families can face similar circumstances on a global scale, they may react differently.

The COVID-19 pandemic, which began in March 2020, introduced unforeseen stressors to life and family development. Nations implemented heightened sanitization practices, reduced physical contact, and lockdowns (Daks et al., 2020; Pedrosa et al., 2020; Tener et al., 2021). Initially, public, social, and occupational life halted to curb the infection spread, impacting various human systems. As weeks wore on, families adjusted to working from home, transitioning to online school, having virtual social lives or lack thereof, and getting closer with the "bubbles" of their households (Daks et al., 2020). How each family reacted to their experienced COVID-19 stressors depended on their location's public health policies, type of occupation the adults of the family had, and various internal factors within the family.

Resilience, an ongoing process of the system that helps the family adapt to changes and find an improved level of functioning, may have contributed to how families are faring after the COVID-19 lockdown period. Three years later, concepts like growth and establishing a "new normal" persist. Amid ongoing pandemic impact, I focus on variations in families' social and

emotional outcomes. However, resilience, rooted in ecological sciences and complex adaptive systems (CAS) theory, holds diverse definitions across research fields.

The purpose of this study is to examine the family systems process of resilience through two frameworks: one aligning with psychological COVID-19 research, and the other incorporating connectedness from CAS theory. I begin with an overview of related systems theories, focusing in on CAS theory and how well it can be applied to family systems, particularly, families with children in emerging adulthood. I next review literature on family resilience, focusing on COVID-19 as the risk or adverse event, protective factors or mechanisms that build resilience, and the outcomes despite or following the adverse event (Maurović et al., 2020). A section is dedicated to family connections to understand the relationship between individual connections among members and how they relate to family resilience. Following the literature review, the study's construction, results, and implications are shared to offer unique perspective into ongoing family resilience research.

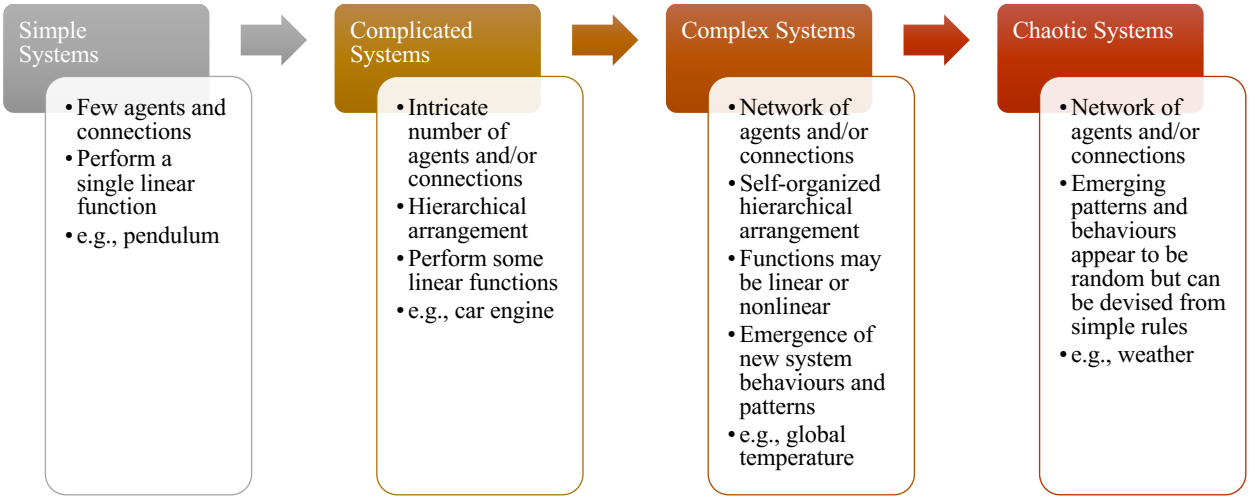
Systems Theory

Scholars have studied systems as early as notable philosophers such as Aristotle and Descartes. They introduced ideas about looking at the whole system and breaking down complex problems into smaller parts to solve them (Cordon, 2013). Over time, researchers sought a unifying theory for understanding the nature of systems. The first such theory emerged as General Systems Theory by von Bertalanffy, to explain that systems existed as more than just the sum of their parts (Fingerman & Bermann, 2000; von Bertalanffy, 1968). Subsequently, scholars developed more intricate models targeting diverse disciplines and increasingly complex systems. Today, "systems theory" is considered the umbrella term for over forty distinct theories (Cordon,

2013). Different branches extend across disciplines, encompassing natural sciences, engineering, agriculture, medical fields, and humanities (Adams et al., 2014).

Figure 1

Comparison of Systems in Order of Complexity



Thinking of the world in systems allows us to understand how many things can be interrelated and affect others. In its simplest form, a system consists of interconnected elements that try to achieve some overall purpose or function (Eidelson, 1997; Meadows, 2008). These elements, or agents, possess shared properties that unify them and allow for interaction (Spronck & Compernolle, 1997). Systems begin with a core structure and progress to increasing complexity (refer to Figure 1). Simple systems have few agents, interconnections, and often a single function governed by simple laws. Complicated systems continue to follow simple laws but involve more agents, connections, and specific functionalities of components (Rickles et al., 2007). Complex systems involve many more components (agents or connections) with repetitions and intricacies that allow for the ability to continue if part of the system is removed and the ability to collectively generate new behaviours or outcomes. Furthermore, chaotic systems generate seemingly random behaviour and dynamic evolution, but these can be

determined through iterations of simple processes (Rickles et al., 2007). Systems manifest in various forms, from manmade creations like machines and factories to living entities like ant colonies and ecosystems. Not everything can be a system, such as sand scattered along a road; the elements, interconnections, and function must all be present to be classified as a system (Meadows, 2008).

Complex Adaptive Systems Theory

CAS theory delves into the adaptive, nonlinear dynamics of complex systems, seeking to explain how these systems yield collective behaviour from simple agents. It analyzes patterns, interrelationships, organization, and complexity "rather than focusing on cause and effect" (The Health Foundation, 2010, p. 6; Mitchell, 2009). Originating in physics, early computer science, and biology, this branch of systems theory has extended into domains like healthcare and behavioural systems (The Health Foundation, 2010). This study focuses on natural CASs, or those involving living systems such as ant colonies, the immune system, and human society (Cordon, 2013; Eidelson, 1997). Therefore, this study adopts social-ecological CAS theory terminology rather than the computational equations, so that it can be connected to the understanding of human families.

The first section describes key processes in terms of what makes a CAS, and the second section describes three properties of a CAS relevant to this study in the manner of the adaptive renewal cycle.

Key Processes. CAS theory's complexity parallels the intricate, nonlinear nature of the systems it examines. Many key concepts are interrelated and can vary on their order of emergence (Turnbull et al., 2018). Some researchers choose to list a distinct number of key properties of CASs, while others derive a natural pattern based on the specific CAS under

investigation (Carmichael & Hadžikadić, 2019; Ellis & Herbert, 2011; Folke, 2006). This section offers a concise overview of CAS relevant to the present study, notably its structure and the concepts of emergence, nonlinearity, and adaptation.

Network Structure. A CAS is a vast network of components, whether agents or the connections among them. While autonomous individually, these components can collaboratively produce larger functions (Eidelson, 1997; Holland, 2006; Stroink, 2020). Agents possess distinct purposes, goals, and behavioural rules (Holland, 2014), and often have a capacity to learn and adjust norms or rules in response to interruptions in their functions (Burger et al., 2021). Interconnections can exist among agents, aggregates of agents, or even larger components. The type of connection depends on the system. Connections can be unidirectional or nondirectional, impacting one or both components (Turnbull et al., 2018). Most connections received or sent are determined by the behaviour the agent can perform and the set of rules the agent follows, fostering interdependency and social coordination (Burger et al., 2021; Eidelson, 1997).

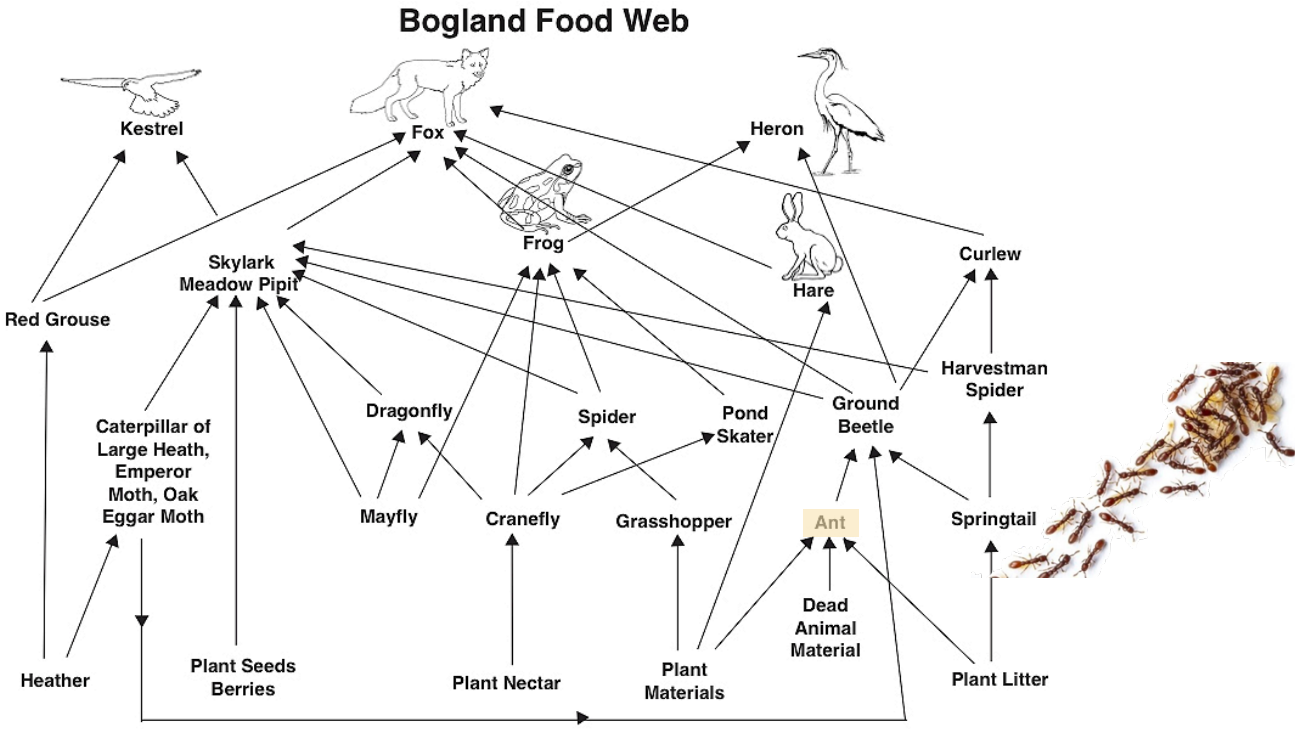
Agents aggregate based on proximity, functionality, or other shared attributes. This aggregation can introduce an element of redundancy or replication of agents, allowing for grouping or replacement if one is damaged or lost from the system (Carmichael & Hadžikadić, 2019). Aggregates and tiers of functions give rise to a natural hierarchical CAS structure (Eidelson, 1997). However, no single hierarchical center controls the system;; the existence of each level and its contributions are important for the overall system to survive, resulting in distributed control (Eidelson, 1997; Holland, 2006). Thus, the CAS network structure is defined by its agents, aggregates, connections, function, and evolving organization.

This hierarchical, decentralized, self-organized CAS structure is often difficult to see at the microscopic level, but is evident at the higher, macroscopic level. An example includes a

food web (see Figure 2). The agents are the different animals, each their own autonomous entity with their own roles and tasks. Aggregates can distinguish mammals (e.g., fox and hare) to primary producers (e.g., plant nectar and dead animal material) to water-based animals (e.g., pond skater and curlew). A hierarchical order emerges naturally, with primary producers at the base, followed by primary, secondary, and tertiary consumers. The top of the web does not control or is the center of the system; they all exist in harmony. Parallel patterns can occur when agents perform the same task (Holland, 2006), exemplified by spiders and mayflies both serving as food for the frog.

Figure 2

Two Complex Adaptive Systems



Note. Ants are agents in multiple complex adaptive systems, such as a bogland food web (left) and an ant colony in search of food (right). Diagram reprinted from *Bogland Food Web* by the Irish Peatland Conservation Council, 2014, http://www.ipcc.ie/discover-and-learn/resources/bogland-food-web/. Copyright 2014 by Irish Peatland Conservation Council. Image reprinted from *Ant Colonies Behave Like Neural Networks When Making Decisions* by D. Kronauer, 2022, https://www.rockefeller.edu/news/32489-ant-colonies-behave-like-neural-networks-when-making-decisions/. Copyright 2023 by The Rockefeller University.

Natural CASs, like most living systems, are open systems with boundaries that allow the system to be affected and influenced by external forces (Cordon, 2013; Spronck & Compernolle, 1997). Agents or aggregates communicate and are influenced by the external world. On their own they have their own set functions with the world. They can communicate with other stimuli organisms, or systems. They can also be a part of a different system, like ants also being a part of both a bogland CAS and an ant colony CAS (refer to Figure 2). In this way, some systems are embedded within other systems, creating a nested multi-level perspective from the highest to the lowest. As systems build on each other and combine to create nested systems, the complexity allows for more sophisticated functions. In this way, micro-level CASs (e.g., the neurological system), can be nested within meso-level CASs (e.g., the individual), which can be nested within macro-level CASs (e.g., family, city, society).

Emergence. Emergence refers to the ability of a system to generate new properties, behaviours, or patterns over time (Rickles et al., 2007). This is done through the processes and interactions at the microscopic level, by the individual agents, without any centralized control whether internal or external to the system. Three areas that "emergent behaviour results from [includes] interactions between individual components or subsystems, feedback loops, and self-organization" (Burger et al., 2021, p.2). This section will describe the modularity of components or subsystems and self-organization, whereas feedback loops will be described in the next section on nonlinearity. From this complex collective behaviour, the CAS can accomplish tasks and ensure its survival.

The iterating structure of a CAS is determined by emergence. Agents combine into aggregates based on similar functions, which can be conceptualized as building blocks to help achieve a more significant effect in the system (Turnbull et al., 2018). Modularity describes

when emerging behaviours and patterns are formed from iterations of smaller building blocks (Camazine et al., 2001; Mitchell, 2009). Through modularity, subroutines of functions in the CAS can "act as building blocks that can be combined to handle novel situations, rather than trying to anticipate each possible situation with a distinct rule" (Holland, 2006, p. 2). As the aggregates start to combine, an overall structure, function, and stability emerge that is only evident when holistically examining the system. The function of a single agent or aggregate may not make sense or match the function of the system as it appears spontaneous or does not require coordination (Stroink, 2020; The Health Foundation, 2010). Nevertheless, collectively, the agents begin to form an overarching purpose or function that would not occur if the smaller functions were not in place. For example, when looking at the human body, each organ (the agents) has its own function, but the whole body (the CAS) must work together to enable it to walk (Jayasinghe, 2012). In this way, "the action of the whole is more than the sum of the action of the parts" (Holland, 2014, p. 2), because of the novel behaviours that arise when the agents are together within the system.

A CAS exhibits emergence through self-organization: the phenomena in which agents come together to exert a task without any direction or centralized control (Camazine et al., 2001; Mitchell, 2009). Agents follow their own behaviours, functions, and are limited by their rules they follow, they can self-organize into an aggregate with others due to proximity, functionality, or other shared similarities (Eidelson, 1997). One of the most common ecological examples of CAS self-organization is an ant colony working together. When a large food source is found, there is no one ant responsible for instructing an organization of ants to bring food back to the colony; through the simple rules of carrying food back and following a scent trail, the colony achieves this goal (Carmichael & Hadžikadić, 2019). Each ant is their own autonomous entity

and there is no direct control from a specific source or environment when it comes to following instructions (Bonabeau, 1998). This self-organization is a natural and self-made pattern by the system, without any influence or direction from the environment (Eidelson, 1997).

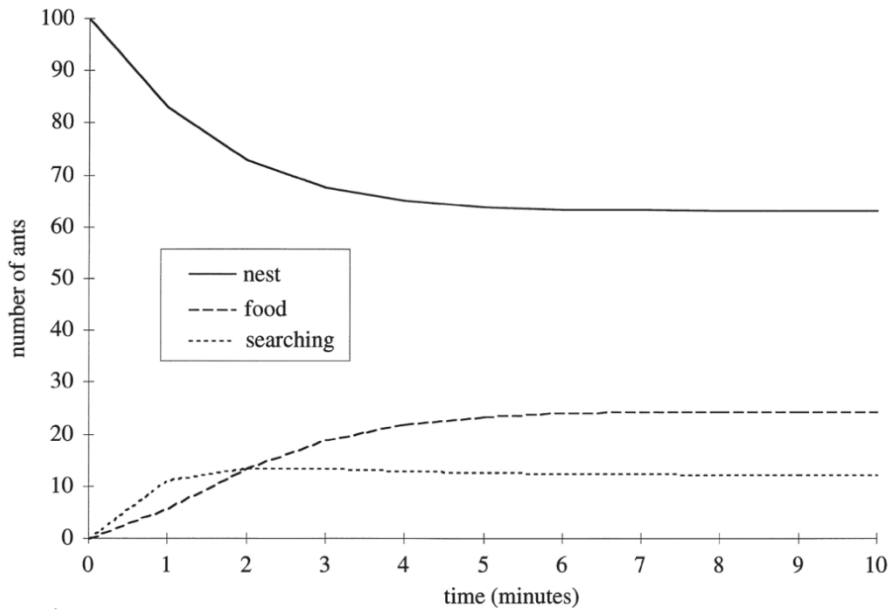
Nonlinearity. One of the first emerging patterns that are necessary in a CAS are feedback systems. If parallel signals come from multiple agents or aggregates, it can help a small change build into a significant change, leading to a mechanism called positive feedback (Eidelson, 1997; Holland, 2006). Alternatively, negative feedback can occur wherein, after evaluating a signal, the agent or aggregate can respond to negate any further action (Carmichael & Hadžikadić, 2019). Due to the network of connections, an agent can belong to multiple types of feedback mechanisms and pathways. Thanks to feedback mechanisms, the system's agents can learn or understand which functions are optimal for certain situations. A stimulus, whether from inside the system or external, can activate one of many functions that can develop into a series of patterns (Turnbull et al., 2018). These interactions within the system can "begin to form emerging patterns which in turn feedback into the system and further influence interactions of the agents" (The Health Foundation, 2010, p. 7).

Unlike a linear system where an increase or decrease of the input or effort put into the system creates respective growth or decline of the output or final product (Meadows, 2008), CASs instead may take on exponential, oscillating, or bifurcating patterns (Eidelson, 1997). Some nonlinear systems have control mechanisms or agents that attempt to maintain a desired equilibrium or balanced range of the output. Many factors can result in oscillations or lags from equilibrium, such as unstable quantities of inputs, agents, or interconnections, as well as the change in velocity of any interconnection, pattern, or feedback loop (Meadows, 2008). When placed on a temporal axis, these mechanisms can create a dynamic system because the function

changes over time, resulting in functions not only far from equilibrium but unpredictable (Meadows, 2008; Spronck & Compernolle, 1997).

Figure 3

Nonlinear Dynamics the Number of Ants in Different Locations



Note. Graph depicting three nonlinear equational models of the number of ants at the nest, at the food source, and in search of food over time. Reprinted from *Self-Organization in Biological Systems* (p.75) by D. Camazine, S., Deneubourg, J.-L., Franks, N. R., Sneyd, J., Theraulaz, G., & Bonabeau, E., 2001, Princeton University Press. Copyright 2001 by Princeton University Press.

Returning to the ant colony, one example of nonlinearity is when the ant colony is in search of food (see Figure 3). In an ant colony CAS, the number of ants performing actions is not in a perfect linear fashion. The number of ants searching for food can be determined by the initial conditions of how many ants are foraging, the accessibility of a food source, the various rates by which ants perform specific tasks, and whether there are other threats to the system (Camazine et al., 2001). Figure 3 only shows three equations of the number of ants in the nest, at the food source, or in search of food, and only over 10 minutes of stable conditions. Within a CAS, it is the multiple smaller behaviours that have these nonlinear trends, never reaching equilibrium.

However, the macroscopic view of the CAS overall remains relatively stable reaching and maintaining a steady state. While a CAS is never set in a fixed state, it looks like "internally generated fluctuations beneath their macroscopic stability" (Eidelson, 1997, p. 50).

Adaptation. Through emerging behaviours, the CAS adapts and evolves over time. With the open boundaries of a CAS, it can interact with its environment and therefore may face many external threats or challenges. Similarly, any errors or losses from within the system can also affect its functioning. To maintain the survival of the CAS, the system needs to collectively learn, adapt, and evolve. This section primarily focuses on the mechanisms by which the CAS can adapt, whereas adaptive capacity or resilience is described in a following section.

Adaptation refers to the ability to change behaviour to survive a problem or system disturbance (Mitchell, 2009). Carmichael & Hadžikadić (2019) differentiates agent-level versus system-level adaptation. At the agent-level, the agent receives information, re-evaluates its rules and understanding of how the world works, and adjusts its behaviour (Carmichael & Hadžikadić, 2019). Some scenarios where agents adapt are shown through processes of learning, competition, and flexibility to change (Eidelson, 1997; Holland, 2006; (Parsons, 2007). At the system-level, a group of agents changes collectively in response to the environment (Carmichael & Hadžikadić, 2019). Most examples are the result of emergent behaviour, such as cooperation, iteration, modularity, and redundancy (Dooley, 1997; Eidelson, 1997; Holland, 2006; (Parsons, 2007). For example, if part of a system is removed, redundancy allows the CAS to persist despite the loss (Eidelson, 1997; Rickles et al., 2007).

The constraints of subsystem's boundaries help confine the actions, errors, or losses to a localized area rather than losing the entire system to collapse (Eidelson, 1997). When a portion of the system is lost, these various mechanisms help the system readjust and continue with the

overall function or evolve the function. In some instances, certain aggregates' functions are more necessary than others and will be prioritized more than other portions (Carmichael & Hadžikadić, 2019; Eidelson, 1997). In other instances, the competition of necessary agents and aggregates results in the gradual formation of an overall structure, and over time, portions of the system change to improve performance (The Health Foundation, 2010). Therefore, web-like connectivity and its complex intricacies are critical for the system's survival (The Health Foundation, 2010).

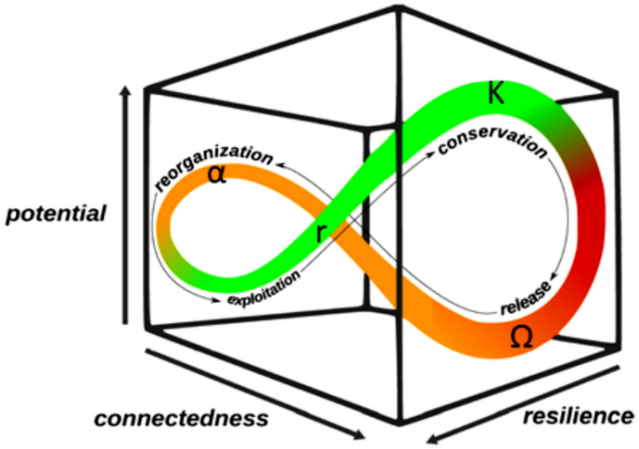
Some mechanisms or features of a CAS are only apparent in the face of a problem to help the system rebuild, downsize, or evolve. Others are ever present in the integrity of the system but shine once a threat emerges. While adaptation (as well as resilience) is a process that best shows itself following a system disturbance, the mechanisms are often in place before any threat, in preparation as a protective factor. After the disturbance, "the system may look similar, but it is not the same system, because like any living system it is continuously developing" (Folke, 2006, p. 257).

Summary. Trying to describe various features of a CAS can appear somewhat circular, because of how interrelated many of the concepts are. Any of the previously mentioned sections (network, emergence, nonlinearity, and adaptation) could be addressed first to describe the subsequent sections. The take-home message is that a CAS is a large network of agents, connections, and processes that enable the system to continue through many different challenges, and this begins the discussion of how it later can be attributed to human families. The ensuing section introduces a circular heuristic model to demonstrate how these systems behave in relation to environmental influences.

Adaptive Renewal Cycle. Gunderson & Holling (2002) have established the adaptive renewal cycle to describe the nonlinear dynamic pattern of CASs in natural environments. This heuristic model applies to most natural CASs who depend on external resources to help produce their functions. The cycle has four stages along three axes (see Figure 4). Note that while "cyclical" often conceptualizes a perfect circle, incorporating three axes causes the cycle to take the shape of a lemniscate (an infinity symbol). The adaptive cycle helps describe how CAS interact with one another. Many interrelated CASs go through their own adaptive cycles and impact the adaptive context of other CAS. Larger CASs may take longer to go through this cycle, whereas smaller CASs might move through it quicker (Stroink, 2020). A given system can also shape the reorganization of connected systems (Holling & Gunderson, 2002), with the smaller CASs' reorganization phase being constrained by the structure of the larger higher systems.

Figure 4

Visualization of the Adaptive Renewal Cycle



Note. Reprinted from "Computing the Adaptive Cycle," by W. zu Castell and H. Schrenk, 2020, *Scientific Reports, 10*(1), p.18175. Copyright 2020 by Springer Nature.

Three Dimensions. The first axis is potential. Potential refers to the ability of the system to grow and develop into its most optimal functioning (Castell & Schrenk, 2020). It sometimes can refer to the amount of space for resources or wealth it can hold, or the capability of change

(Holling, 2001; Holling & Gunderson, 2002). When potential is low, there is a limited amount of options or productivity available. When potential is high, the possibilities of high function and productivity is high. This addresses the system's functions, ensuring it can be productive with adequate resources to be used (Holling & Gunderson, 2002).

Another axis is connectedness. Rather than the number of connections, this refers to the "internal controllability" or the degree of rigidity among the connections between agents, aggregates, and hierarchical levels (Holling, 2001, p. 394). When connectedness is low, it could mean there are many possibilities for connections. When connectedness is high, the system is considered overconnected and is too rigid or stable to adequately survive after facing an incoming stressor (Holling & Gunderson, 2002).

The final axis is resilience. Resilience, also known as adaptive capacity, refers to how invulnerable a system is after a shock, change, or disturbance (Holling & Gunderson, 2002). More presciely, Holling (1973), who is known for coining this term, defines resilience as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (p. 14). It can be considered the survival of a system. Resilience is not only a return to a normal or previous state but can often resemble renewal, reorganization, regeneration, and transformation out of adversity (Folke, 2006; Walsh, 2016). When resilience is low, the system is more vulnerable to shock and can be damaged. When resilience is high, multiple mechanisms are in place to ensure that the system's function, structure, and identity are maintained (Meadows, 2008).

Four Phases. The four phases of an adaptive renewal cycle are growth, conservation, release, and reorganization. The growth phase is when resources and connections increase (Folke, 2006). This means that potential and connectedness begin low, whereas the system's

resilience is adequate. The conservation phase stores and stabilizes these resources and connections, making the system more rigid (Folke, 2006). Potential and connectedness are now at an all-time high, while the system's resilience is very low. The release phase occurs when the system collapses due to the rigid organization (Stroink, 2020). Potential has been depleted, connectedness was high, and it is the capacity of the system's level of resilience for the system to continue. The cycle completes at the reorganization phase, where materials and resources are reorganized through innovation and restructuring to become available for the upcoming stage (Holling & Gunderson, 2002). This means that potential and resilience can start to increase while connectedness decreases to reorganize. The system can then restart the cycle at the growth phase.

Summary. The relevance of the adaptive renewal cycle for this present study lies in the three domains. The adaptive renewal cycle shows the relationship between potential, connectedness, and resilience, and that they can be at different levels at each phase. One needs to consider the interplay of connectedness, resilience, and potential, and how CAS more often has mutual causality than linear cause-and-effect relationships.

Summary & Implications. A CAS is made of complex interconnections, functions, and emergent patterns that attributes to different levels of three properties: potential, connectedness, and resilience. The open boundaries of natural CASs mean that the system can face different types of challenges or threats, and that its survival depends on the resilience of the system. Yet CAS theory describes how interrelated resilience is to so many other attributes, not only potential and connectedness but also to the notions of emergence, nonlinearity, adaptive mechanisms, and the intricacies of the network structure. To study CASs often takes on a more macroscopic view, but elements can be applied to specific examples such as CAS. Before fully extrapolating CAS theory to human families, I turn to existing literature on family systems.

Family Systems Theory

A separate branch of systems theory that focuses solely on human families is family systems theory (FST). FST centers on the family system, where the agents are made up of family members, and the focus is on understanding the rules, functions, and impacts of within-family behaviours (Fingerman & Bermann, 2000). It also addresses the beliefs of the individual family member regarding their role and expected behaviours (Fingerman & Bermann, 2000). However, FST appears to be more of a generic term that encompasses an umbrella of ideas rather than a distinct theory.

The operational definition and scope of a family system depends on the study. Bavelas and Segal (1982) capture a generic definition of the family system as a "special set of people with relationships between them; these relationships are established, maintained, and evidenced by the members communicating with each other" (p. 102). Some researchers focus on parents and their offspring; others include more generations as part of the system or as a subsystem. When family sciences began, most researchers targeted the nuclear family as the superior form of a family, which involves two heterosexual parents and their direct offspring (Fingerman & Bermann, 2000). Nowadays, we see many more variations of the family structure acknowledged in research, such as non-heterosexual parents with or without children, single parents with one or many children, families with fostered members, grandparents as parents, or blended families, to name a few (Slade et al., 2017). Different ethnic or other cultural backgrounds can also influence family structure, relationships, roles, and rules (Thompson et al., 2019). The most common perspective of FST is the focus on the family during the child's developmental years in an environment of adult supports such as parents, grandparents, and other caregivers (Fingerman &

Bermann, 2000; R. Hill, 1971; S. Minuchin, 1974). Evaluating the family unit as a variant of a system helps to determine patterns and functions about how they may interact.

History of Family Systems Theory. The development of FST took two simultaneous pathways over a series of decades. Fingerman and Bermann (2000) differentiate these two pathways as one focusing on family sciences and the other on mental health. The first path originated from the family sciences and drew from the previously mentioned General Systems Theory to describe the family as a system (Fingerman and Bermann, 2000). The second path, which tends to dominate in FST literature, arose from clinical researchers such as Bateson, Jackson, Haley and Weakland, who began family therapy as an unconventional treatment for psychiatric patients who did not respond well to the available psychotherapies at the time (Bavelas & Segal, 1982; Fingerman & Bermann, 2000; Johnson & Ray, 2016). These researchers considered "viewing disturbed behaviour as disturbed *communicative* behaviour which is maintained and structured by interaction with others in a social context" (Bavelas & Segal, 1982, p. 100). The goal of family therapy was to observe family members' interactions and communications with each other and help bring the family back from what was deemed "dysfunction" to "function" (Johnson & Ray, 2016). Although both pathways comprise FST, it is the family therapy pathway that is emphasized most.

Aside from the notion that the family is a system, FST is more often conceptualized as a clinical application rather than a set of systems theories. These clinical applications span psychodynamic, experiential, structural, behavioural, and cognitive behavioural approaches (Capuzzi & Stauffer, 2015). Within family literature, "family treatment was called research" (Bavelas & Segal, 1982, p. 99), and the many theories describe dysfunctional family patterns. The most prominent is Bowen's Family System Theory (Bowen, 1974), which specifies eight

concepts of family system dynamics that lead to dysfunction and require assistance. Families in the lens of FST are often researched using case studies, the development of genograms, and extensive interviews involving the entire family (Fingerman & Bermann, 2000; Hadfield, 2000; Johnson & Ray, 2016). FST is then used by clinicians as a framework to guide family therapy based on reorganizing communication patterns, boundaries, and equilibrium (Lang, 2020; P. Minuchin, 1985). The emphasis is to take on a higher systems-level perspective and treat the unit as the family, not a specific individual.

Key Concepts. Before the clinical applications, and throughout the sparse FST literature about family sciences, there exists enough overlapping concepts that one can describe a family system. Most of these concepts are found within Structural Family Therapy by Salvador Minuchin (1974). This therapy focuses on approaches that analyze "how parts in a system interact, how homeostasis is achieved in a system, how system feedback works, and how dysfunctional communication patterns develop in a system" (Yaşar, 2017, p.666). However, while Minuchin's works begin to touch on boundaries and subsystems within the family, he then goes on to outline therapeutic implications and applications using case studies (S. Minuchin, 1974; Yaşar, 2017). As well, he describes family structure by the current functions, goals, or power influence of certain members to organize the interactions and behaviours within the system, of which therapy will be applied to reshape the imbalance (S. Minuchin, 1974). Reuben Hill, who focuses more on a family development framework FST, focuses on family structure in terms of the positions, roles, and clusters of members within the system (1971), of which clusters can be synonymous with CAS aggregates or FST subsystems. Therefore, the structure or mapping of a family system depends on the framework being studied.

Nonetheless, from Structural Family Therapy and additional features from other FST literature, concepts emerge including family structure, transactional patterns, equilibrium-seeking behaviours, and adaptation. These coincide with the previous CAS key concepts section regarding the network structure, nonlinearity, and adaptation. Instead of mapping out the various lists of key concepts or assumptions that differs per author (like the literature within CAS theory), this section summarizes these four areas throughout FST literature due to their relevance for the present study.

Family System Structure. All FST relies on the family being a system, wherein the agents are the family members (Bavelas & Segal, 1982; Thompson et al., 2019; Yasar, 2017). These agents have their own purposes, rules, and norms, which develop as the individual goes through the life cycle, but they are interdependent towards each other (P. Minuchin, 1985). Members can create subsystems or aggregates nested within the larger family system (Daks et al., 2020; S. Minuchin, 1974; Perrin, 2010). Subsystems can be organized by age, gender, generation, interests, or other categories, and members can coexist within multiple subsystems like a child belonging to the parent-child and sibling subsystems (Capuzzi & Stauffer, 2015; S. Minuchin, 1974). The subsystems can be autonomous but often function in an interdependent manner (P. Minuchin, 1985; Ram et al., 2014). Note that family structure here refers to the makeup of the family unit in terms of agents, connections, and subsystems, not to be confused with the different family structures mentioned beforehand regarding the specific set of agents into categorical types of families (e.g., nuclear, same-sex parent, or intergenerational).

Family systems are nested within other systems. By increasing our multisystemic viewpoint, one family system can exist within larger metasystems, such as in a neighbourhood or family friends, or society at large (Hadfield, 2000; Spronck & Compernolle, 1997). Each agent is

also an agent in community, workplace, and society systems, so their behaviour in the family (e.g., expectations about gender roles) will be influenced by these other systems too. Because of the select openness of the family system's boundaries, members of the system can be affected and influenced by external factors such as other families, friends, school, work, or natural disasters (R. Hill, 1971).

Transactional Patterns. Transactional patterns, like the concept of emergence, stem from the collective behaviour of family members. Similar to CAS theory, FST emphasizes that the family as a whole is greater than the sum of its parts (Freeman, 1977; Spronck & Compernolle, 1997). Transactional patterns, also referred to as interactional processes or family dynamics are patterns of interaction or communication within the system that cannot be defined using only a single member of the family (Hadfield, 2000; S. Minuchin, 1974; Morgaine, 2001; Ng & Smith, 2006). They are maintained or influenced by the system's implicit or explicit rules, hierarchy of power, exchanges of information, boundaries between and within subsystems, or interdependency among subsystems (P. Minuchin, 1985; S. Minuchin, 1974; Murray, 2006). One of the more consistent themes in FST is that patterns are circular, not linear (Bavelas & Segal, 1982; P. Minuchin, 1985; Spronck & Compernolle, 1997). This means that behaviours are not necessarily cause and effect, where responsibility or blame can be assigned, but that there is a cycle of interaction that is mutually sustained by each agent within the family (Hadfield, 2000; P. Minuchin, 1985).

Most FSTs focus on unhealthy patterns, dynamics, or behaviours within a family system and help the family move and adapt towards healthier actions (S. Minuchin, 1974; Perrin, 2010; Thompson et al., 2019). Various family system therapies dive into patterns such as triangular relationships, symmetrical and complementary patterns of behaviour, coalitions, and circular

causal relationships (Johnson & Ray, 2016; Ng & Smith, 2006). Some focus on intergenerational patterns such as differentiation, emotional fusion, and psychiatric symptoms or illnesses (Thompson et al., 2019). Here I only briefly allude to these patterns because they are more often considered maladaptive in the literature, but this is not always the case.

From transactional patterns, the family system exhibits self-organization. Self-organization arises often in response to a change or challenge internal or external to the system (S. Minuchin, 1974; Ram et al., 2014). The existing configuration of the family structure was not possible for the system to continue to function properly, so the system transforms, often without conscious effort or control (Ram et al., 2014). Self-organization often occurs when the child goes through their lifespan developmental processes and the family system adjusts to the changing dynamics arising from this stage of development (Ng & Smith, 2006). Some authors assert that this is a common feature within family systems.

Feedback Systems. Family systems are not only nonlinear by their circular patterns, but also through their many positive and negative feedback loops. Much of the FST literature focuses on the negative type of feedback loop as they describe family systems having homeostatic or equilibrium-seeking behaviours for the maintenance of patterns (R. Hill, 1971; P. Minuchin, 1985; Ng & Smith, 2006). The family system has a threshold of tolerance for transactional patterns, trying to keep preferred patterns within a specific range or otherwise producing mechanisms to re-establish the balance (1974). Something, such as an external challenge or a specific behaviour or demand from one of the agents, disrupts the family balance, and the family system uses several techniques to self-regulate and re-establish equilibrium (R. Hill, 1971; P. Minuchin, 1985). On the other hand, positive feedback encourages a change or behaviour, such as an older child testing his independence and the parents encouraging and

increasing such independence (Bavelas & Segal, 1982). Negative feedback is more common in FST literature than positive feedback due to the therapeutic implications. In the above example, negative feedback presents itself if the parents denied independence and autonomy, or if something happened to the child in the outside world "and the child must be rescued and brought home again" (Bavelas & Segal, 1982, p.104). However, positive feedback can also be considered poorly, such as if the child is too young to be pushed to have more independence (Bavelas & Segal, 1982). Both feedback systems can be advantageous and disadvantageous, depending on the reaction of the agents and whether it helps the agent or whole system grow and evolve or not.

Adaptation & Evolution. Family systems adapt and evolve as they go through internal or external challenges. S. Minuchin (2017) states that challenges can occur from the external world to one family member (e.g., a child being bullied) or the whole family (e.g., an environmental disaster that damages their home), or from internal challenges such as transitional points (e.g., a child becoming an adolescent) or idiosyncratic problems (e.g., a family member with an impairing health condition). The challenge disrupts the established patterns and the existing equilibrium, and the system's agents must challenge the existing patterns, explore alternatives, and produce new patterns to the new circumstances (P. Minuchin, 1985). These can be achieved through feedback mechanisms, self-regulation, reorganization, and establishment of new patterns. R. Hill (1971) states this process similar to the adaptive renewal cycle, wherein the family system goes from equilibrium to disequilibrium to reorganization and lastly to new equilibrium. While this leads into the discussion of resilience, that construct will again be addressed in a later section.

Reflection & Summary. Similar to CAS theory, the concepts and principles of FST appear in other frameworks and theories. There is also a circular interrelationship to these four

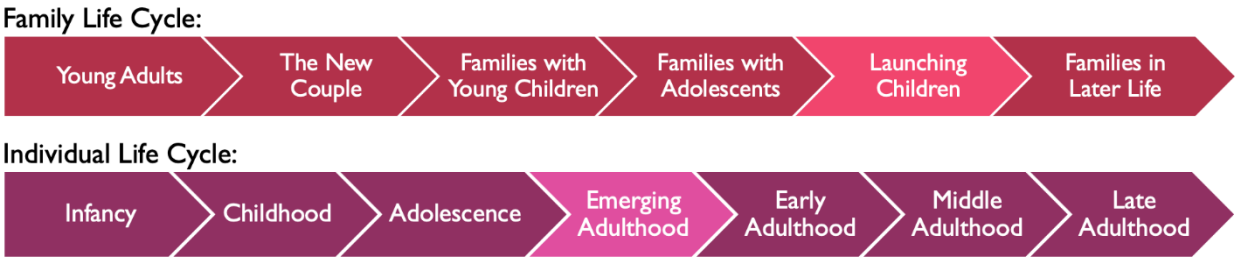
broad areas, where focusing on one can build up another. I contend that a family system is an example of a CAS, a viewpoint already echoed by R. Hill (1971) and Henry and colleagues (2015). While a human family might not appear to have a large number of agents, as per most definitions of a CAS, its network is supported in the many ways the agents have different types of connections to one another. Furthermore, Eidelson (1997) notes that a CAS requires a vast array of diverse components, a criterion met by the many complex connections inherent in human interactions and family systems. FST distinctively centers on a particular type of CAS — the family CAS — and goes on to discuss therapeutic applications, rather than keeping a generic overview allowing for different types of CASs and the relationships among different CASs.

This section delineated the family CAS and some of their inherent processes. It introduced similar notions of the structure, the emergence of transactional patterns, nonlinearity by means of feedback systems, and adaptation. As these key concepts finish with evolution, it ties into the understanding that there are different stages of family development. The following section clarifies these stages and where the focus of this study resided.

Understanding Family System Development. Family systems are complex wherein they exhibit nonlinear functions but for the most part also follow along a developmental model. To say that family systems with infant children or adult children have the same operating processes at the same time would be an inappropriate overgeneralization. It is better to specify the family system at a specific stage of development, and this study has chosen to focus on children in emerging adulthood due to their sparse focus of study within family research. This section highlights the intricacies of family systems during this stage in the family and in the individual (see Figure 5).

Figure 5

Intersections of the Emerging Adult Within Family & Individual Lifespan Development



Family Life Cycle. S. Minuchin only briefly touches on family development, going up until the child moves out of the house (1974), but this section primarily relies on the six stages of the traditional middle-class family life cycle by McGoldrick & Carter (1988). McGoldrick & Carter (1988) begin with young adults leaving the home, single, to achieve more autonomy and self-responsibility. S. Minuchin begins at the second stage of new couples, when two individuals combine and begin to develop mutual accommodations and transactional patterns (McGoldrick & Carter, 1988; S. Minuchin, 1974). The birth of a child marks the beginning of families with young children and as the child develops, it leads towards families with adolescents (Carter & McGoldrick, 1988). The launching children stage is when the child has developed into an adult and is "launching" into the adult world and differentiating from the family (Carter & McGoldrick, 1988), where arguably the children go on to begin a new cycle and a new family. This stage is where the focus of this study resides. Less discussed in family literature are families in later life stages, where the older parents work on accepting the shift in generational roles (Carter & McGoldrick, 1988; Fingerman & Bermann, 2000). Note that this model follows a distinct linear fashion, but with the complexity of human life, it does not fully take into consideration the families having multiple siblings, if another family member (e.g., one of the

parents) leaves the home, if a different family member joins the home (e.g., adopted or foster child, grandparents), or the separation or loss of one or many family members.

Individual Life Cycle Agents in the family go through their own lifespan development, meaning that there are many individual life cycles within the family life cycle. Previous models have mostly considered infancy, childhood, adolescence, and adulthood (Erickson, 1980; S. Minuchin, 1974), but more sophisticated models recognize unique differentiations throughout adulthood. Specifically, there existed a differentiation of early, middle, and late adulthood (Erickson, 1980). Arnett (2000) provided an additional stage of emerging adulthood because there was still a missing piece between adolescence and early adulthood, to be discussed in more detail below. The parent(s) within the family system will reside between emerging to late adulthood, whereas the children begin at infancy and make their way through the lifespan. The parents are there to support their development. At transitions between developmental stages, the family often faces new challenges as they adapt to the restructuring of roles, expectations, and levels of flexibility (S. Minuchin, 1974). The next section focuses on this stage of emerging adulthood and how it reflects within the family system.

Emerging Adulthood. Emerging adulthood encompasses individuals who are between the ages of 18 to 29 (Arnett, 2000; Hochberg & Konner, 2020), though some researchers limit the upper range to age 25 (Lally & Valentine-French, 2019). In the developmental life stages, emerging adulthood is unique from adolescence and adulthood due to heightened identity exploration, instability and uncertainty, self-focus, feelings of being in-between, and optimism towards dreams and possibilities (Arnett, 2000, 2006; Lally & Valentine-French, 2019). In the family life cycle, the launch of adult children into the world represents what researchers consider parent-child separation and renegotiation of family roles (Oliveira et al., 2020). In most FST, this

stage considers the child individuating from the family and going on to develop their own family system, leaving behind their family of origin (Fingerman & Bermann, 2000).

Few FST models target children in emerging adulthood. Much FST literature discusses parents and children, but the common premise is when the children are under the age of 18. Studies regarding these children and their families (now referred to as their family of origin) have been performed regarding adverse childhood experiences (Carr & Kellas, 2018), autonomy and individuation (Ferriby, 2015; Whiteman et al., 2011), and acceptance within LGBTQ+ communities (Milton & Knutson, 2021), but less so regarding the dynamics within the family of origin. Lindell and Campione-Barr (2017) speculate that little research has been done "because both parents and siblings appear to lose ground in their relative importance during this time" (p. 390) and that any relationship with them will become more voluntary. Their social supports may be adjusting away from the family and more onto their peers (Lindell & Campione-Barr, 2017). However, they are still impacted by these familial relationships, no matter how distant the connection is. Due to transactional patterns, shared events and milestones, and simply interactions among members, families of origin strongly impact an individual's development, as will they continue to impact the lives of emerging adults (Jia et al., 2021).

Lindell and Campione-Barr (2017) wrote about how dyadic connections adapted and altered as a child transitioned into emerging adulthood. They look at both positive and negative relationship features on the parent-child dyad and the sibling-sibling dyads. For the parent-child relationships, they found that the frequency of contact decreases, the time spent doing leisure decreases, the time in conflict or fighting decreases, and physical displays of affection decrease. However, they found that there is reciprocal support in terms of financial and emotional support from the parents and future assistance from the children. Additionally, the closeness of their

relationship could be maintained if the family environment growing up was supportive. For the sibling relationship, contact, conflict, and performing physical activities together all decrease, but emotional support, intimacy, and instrumental aid increase (Lindell & Campione-Barr, 2017). We can presume these as the baseline of healthy family relationships in young adulthood.

Interestingly, recent statistics are indicating that Western families of origin are staying together under the same household longer than before. The number of young adults in Canada ages 20 to 34 living with their family of origin has increased by 5% since 2001, whereas young adults leaving and living with their own families have decreased by roughly 7% since 2001 (Statistics Canada, 2016). According to the 2016 Census by Statistics Canada, almost 35% of young adults ages 20 to 34 lived with at least one parent in 2016, a trend also noticed in the United States and Europe (Statistics Canada, 2016). According to Furstenberg (2010), young adults may be leaving the family home more slowly due to aspirations for a job that requires post-secondary education, desire for financial stability, delayed childbearing through contraceptives, or a positive and stable quality of relationships within the family of origin. Therefore, there may be a higher chance of stronger connections between young adults and their family of origin that is worth investigating.

Summary

Using CAS theory as our basis, we can picture the family as an ever-adapting system to incoming challenges. Many families can uphold the key features of a CAS, notably a network structure, the emergence of transactional patterns, and elements of adaptation and evolution. Since families can evolve, focusing on one stage in the family life cycle, notably the stage of launching families, can help to pinpoint specific dynamics and ongoing processes within the system. It is not surprising how emerging adulthood continues to be a struggle to understand the

family system, as the individuals put more focus on autonomy away from the family of origin. However, if trends are shifting such that children are staying at home longer and perhaps through their entire emerging adult years, updates to the literature regarding this stage may be warranted.

Families of origin have already gone through significant evolution. While Western families can exist in various structures, they likely align somewhat within this stage of family development. Consequently, an interruption or trauma such as COVID-19 may affect such development. While I recognize unique idiosyncratic and structural features have led to different outcomes for families, focusing on individual family connections and family resilience may help to understand the effects of COVID-19 on this life and family developmental stage. Now I turn to another area of family literature to understand how families can withstand such interruptions or adversities during development.

Family Resilience

Family resilience exists as a separate body of research from FST as well as CAS resilience. Resilience in psychological research comes from several different backgrounds and conceptual frameworks. Family resilience is "complex and multisystemic" and moves beyond the individual and into the emergent properties of the family system and its available resources (Distelberg et al., 2018, p. 460). To better understand this concept, this section summarizes the development of psychological resilience, its applications to family resilience, various models of family resilience, and its contextualization within the present study.

History of Resilience in Psychology

While resilience was first introduced by the ecologist Holling (1973) through the lens of a CAS, it is a term researched differently in the various fields of physics, engineering, geography, ecology, economy, epidemiology, and psychology (Folke, 2006; Folke et al., 2010; Maurović et

al., 2020; Welsh, 2014). Psychological resilience generally refers to the ability of an individual to overcome stress or adversity or have a good outcome despite the stress or adversity (Ungar, 2012). However, this term is becoming overused and misinterpreted when comparing operational definitions, as researchers dive into different conceptions or theories. Therefore, it is vital to recognize the development of psychological resilience construct as it grew out of ecological resilience and the different stances researchers can take to understand this concept.

Looking first at the origin of resilience in ecology, there are two conceptualizations that are relevant to psychology. Ecological scientists included human impact within the term socio-ecological resilience, which looks at how the resilience of the system is reliant on the interdependency of ecological and human systems (e.g., societal or political; Cretney, 2014; Folke et al., 2010). This model looks more at a "biophysical environment-community" conception of resilience, but does not really consider the individual (Welsh, 2014, p.15; Stroink, 2020). The other conceptualization is psycho-social resilience, which looks at the individual and their social supports or community resources (Welsh, 2014). It looks at the process of building resilience as an adaptive response to a trauma, through qualities within the individual and its surroundings (Distelberg et al., 2015; Walsh, 2016). This is where most of the theories and models regarding psychological resilience lie.

Most researchers describe the history of psychological resilience along four waves. Each historical "wave" conceptualized resilience slightly differently, complicating the literature and providing various operational definitions of what encompasses this term. The first wave looked at psychopathologies in children living in the Great Depression, identifying specific characteristics or domains that could be described as having resilience (Lipsitt & Demick, 2012). This initial research conceptualized resilience as a *trait* or a collection of traits that make up a

resilient person (Distelberg et al., 2015; Patterson, 2002a; Walsh, 2016). Research that continues down this path has tried to differentiate it from the other waves as "resiliency" (Patterson, 2002a). The second wave of researchers agreed that resilience is a *process* of building up to recover and persist (Welsh, 2014). This wave of research focused on processes, stressors, attachment, resources, and social supports within the individual (Lipsitt & Demick, 2012). The third wave looked at *protective factors* that promote resilience, focusing on prevention and intervention programs for individuals (Lipsitt & Demick, 2012). The final wave of resilience research began to integrate resilience beyond the individual level and towards *multisystemic frameworks* of families, schools, and workplaces (Maurović et al., 2020; Ungar, 2012). The increased focus on systems beyond the individual has resulted in resilience being categorized in many ways such as social, community, urban, and family resiliencies (Cretney, 2014).

Family resilience arrived during the fourth wave of resilience research as family researchers broadened the viewpoint from parent-child interactions to a network involving the surrounding environment (Distelberg et al., 2015; Walsh, 2016). However, researchers from previous waves have conceptualized family resilience as a trait, a process, or an outcome (M. Hill et al., 2007; Maurović et al., 2020; Patterson, 2002b). Maurović and colleagues (2020) try to collate the history and define family resilience as a *process* that focuses on the risk or adverse event, the protective factors or mechanisms, and the good outcome despite or following the adverse event.

Operating Definition

Family resilience as a process fits alongside the understanding of resilience in CAS theory. For the benefit of the present study, family resilience is operationally defined as a property of the family system that depicts the process to withstand certain stressors while

maintaining its integrity and its overall function. Rather than just trying to return to equilibrium, this dynamic process requires an understanding of the particular disturbance or risk and how it impacts the system, the mechanisms already in place within the family system to withstand this risk and flourish past it, and an outcome to determine the function and integrity of the system. Each of these three areas that relate to the present study are discussed next.

The Risk: COVID-19

The COVID-19 pandemic is assigned as our "risk" or major stressor that the family system faces to expose the system's level of resilience. The pandemic affected everything worldwide, from workplaces and families to economies and organizations. It also affected the ability to perform research; with lockdowns and public health measures preventing many from leaving their homes, much of the literature first began with speculations, suggestions for moving forward, and then empirical research began. This section splits some of the existing COVID-19 research into two areas: the first half looks at COVID-19 stressors and impacts on families, and the second half looks at COVID-19 and CAS research, particularly how the adaptive cycle was implicated. This will provide more understanding of the risk or challenge the family CAS faced starting March 2020 onwards.

First and foremost, it is important to acknowledge that nations experienced the COVID-19 pandemic differently with oscillating "waves" of infections that were not necessarily in sync across the world. A variety of factors aided the dramatic differences between countries and cities, and regions, including the severity of public health measures, population density, cultural differences, vaccination roll-out and willingness, and incidence of different COVID-19 variants (Lindinger-Sternart et al., 2021; Sturmberg & Martin, 2020). Therefore, I try to keep much of the

number of stressors relevant to the population of Thunder Bay, Canada, as this is where the research collection took place.

COVID-19 Stressors and Impacts on the Family. Many articles have produced large laundry lists of the types of stressors that individuals and families could have faced because of the COVID-19 pandemic. Here, I have organized the most common physical, emotional, and social stressors. Physical stressors included getting the virus itself, changes to food security, sleep quality, or access to exercise and wellness (Masten, 2021; Sturmberg & Martin, 2020; Walsh, 2020). Emotional and psychological stressors included feelings of fear, uncertainty, loneliness, avoidance, compulsive behaviour, grief, loss of social functioning, compulsive thinking, worry, lack of concentration, and apprehension of the future (Pedrosa et al., 2020; Walsh, 2020). This also includes an increased prevalence of mental health disorders, suicide, protests against mandates, and fears about vaccine effectiveness or national roll-out protocols (Lindinger-Sternart et al., 2021; Mckee et al., 2021; Pedrosa et al., 2020; Tener et al., 2021). Social stressors include social isolation, changes in the occupational environment or a complete job loss, financial stress, limited or no access to places for socialization, and the social aspects that relate to the aforementioned stressors above (Lindinger-Sternart et al., 2021).

However, COVID-19 stressors affected individuals or families to varying degrees along multiple dimensions. There is considerable variability, as some were more vulnerable based on pre-existing demographics. This includes having a lower household income, having a pre-existing mental health, autoimmune, or disabling health condition, or experiencing racism or marginalization (Prime et al., 2020; Tso et al., 2020). Blacks, Latinx, LGBTQ+, elderly, children, college students, homeless, prisoners, healthcare professionals, and those living in rural areas were disproportionally more at risk of mental health burdens (Pedrosa et al., 2020). Likely

due to stay-at-home lockdowns, there was an increase in domestic violence (Rahayu et al., 2021; Tso et al., 2020). Therefore, all families did not experience the same number of stressors, and some families were at much higher risk of experiencing more.

When considering a systems perspective, we also can acknowledge the interplay and impact on relationships, rather than just the number of stressors. Note that most of the literature regarding COVID-19 and FSTs are constrained to families during the early developmental periods. Although most of the literature regarding FST and COVID-19 focuses on childrearing families (e.g., the parent juggling parenting young children and working from home, or the impact of the child's disruption in education; Prime et al., 2020; Stark et al., 2020), there are some aspects that apply to the stage of the emerging adult and their family of origin.

Eales and colleagues (2021) performed a mixed-methods study that included a qualitative thematic analysis of the impact COVID-19 had on American families, of which some noteworthy impacts apply to families with emerging adults. The parenting category included parenting style changes, concern for future transitions, and child development concerns. The family dynamics category included relevant themes of quality time, teamwork and conflict resolution, separations and transitions, changes in routines, limited socialization, new routines, and better/worse relationships. Notice in these examples, that family impacts could be either negative or positive. Due to the forced proximity because of social lifestyle changes, some families were able to use this as a positive experience and grow better, whereas others faced more stressors and worse outcomes such as domestic violence, fights, or child maltreatment (Eales et al., 2021).

It is the interplay of both COVID-19 stressors and impacts that can influence how a family was affected during these last few years. Some families could have faced a barrage of stressors, but the perceived risk may not have been as noteworthy and perhaps they came out

with positive impacts. Likewise, others may have only experienced a few stressors (e.g., lockdown), but the family dynamics were severely impacted by these few stressors. This study will ensure to include both aspects in addition to possible demographic vulnerabilities.

COVID-19 and CASs. Researchers also investigated COVID-19 impacts on CASs. Sturmberg and Martin (2020) highlight that the pandemic revealed that "everything is connected to everything else," (p.1361), illuminating the interconnectivity of different systems and agents. It is noteworthy that research regarding COVID-19 and CAS theory has for the most part been published within community-level or larger-scale systems, such as national healthcare systems (Biswas et al., 2020), higher education systems (Ueland et al., 2021), disaster response systems (Guo et al., 2021; Sampugnaro & Santoro, 2021; Slater et al., 2022); only one paper explicitly mentioned CAS theory within a smaller scale system, the autoimmune system (Jones & Yeralan, 2022). This is useful when we consider the multiple levels of CAS systems, wherein the family system would be impacted by these larger level CASs and their levels of potential, connectedness, and resilience. Higher system levels could provide information or signals to limit the potential of lower system levels (Holling & Gunderson, 2002; Walker et al., 2020). Similarly, the capacity for self-organization or other responses of lower system levels was too low to match the overall system's demands (Sturmberg & Martin, 2020).

Some researchers made the link between the adaptive renewal cycle and the COVID-19 pandemic. While systems that were relatively stable were in the conservation stage, the pandemic served as a trigger or accelerant for the release phase in CASs (Schroder, 2020; Van Aerde, 2020). While release phases are often triggered by a change in conditions, such as a new competitor or failure in leadership, the worldwide halt through lockdowns brought many, if not all, systems into release simultaneously (Schroder, 2020). Most authors wrote here at this stage

of the pandemic, trying to provide counsel during this uncertainty of the release phase. Van Aerde (2020) notes that COVID-19 exposed various systems' weaknesses during the conservation phase. Schroder (2020) emphasizes the importance of networks and relationships to preserve the vital functions to continue survival of the CAS. Zhang (2020) considers that when systems enter the reorganization phase, there could be a "competition between multilateralism (or global interdependence) and unilateralism (or protectionism)" (p.4). Some systems may not survive this change, whereas others will depend on agents' innovation and facilitating small functions to test and learn to adapt (Schroder, 2020).

A year into the pandemic, Kinchin (2021) acknowledged that while adaptive cycles are constrained to the cycles of larger CAS, it does not necessarily mean that they are totally synchronised. In his paper, he used leaders in university CASs as his example, where not every leader had similar comfort levels for virtual schooling or had similar resources to offer lectures online. Similarly, public health, political and economic circumstances can continue to exacerbate the effects of COVID-19 on a particular CAS. The article finishes with the importance of resilience, notably Holling's definition that focuses on persistence, adaptiveness, variability, and unpredictability (Kinchin, 2021).

This far along into the COVID-19 pandemic, depending on the system, some might still be in the release phase, while other CASs may have evolved and moved into reorganization, growth, or even possibly a new conservation. Using the adaptive renewal cycle to explain COVID-19 impacts is necessary as "the forthcoming reorganization phase will be critical to how the new system is structured and behaves" (Walker et al., 2020, p.2). Therefore, when looking at smaller CASs, we must be aware that depending on the impact of COVID-19, each system may be at a different phase, thereby having different levels of potential, connectedness, and resilience.

Summary. COVID-19 showed how many CASs are interconnected and collectively impacted. Many were triggered into a release phase, and nested CASs were subsequently affected by the larger systems. The reorganization of smaller human family CAS would be constrained to their interconnected higher-level CASs, such as the education system, the adult members' occupation, public health, and other systems. Therefore, if higher-level CASs are still in the release stage or moving past it, so may be family systems. Since CAS is more focused on a larger picture and bigger systems framework, the following section dives into a different area of research that centers on these smaller systems. Nonetheless, COVID-19 can be treated as our risk or disturbance to the family system; it is now the focus of what these smaller systems have behaved and the processes to survive such disturbances.

If I consider the family system a CAS that undergoes the adaptive renewal cycle, then I presume the lifestyle changes brought about by the COVID-19 pandemic have expedited systems into the release phase (Zhang, 2020). Three years into the pandemic, some families may still be in the reorganization phase of the adaptive renewal cycle, while others may have moved beyond to different stages. In addition, COVID-19 changes may have impacted many typical processes in the family developmental cycle, such as the typical expectations of children in the emerging adulthood stage. Moving forward, the developmental stage of emerging adulthood must now be contextualized within this period of the post-COVID era, as it is unknown how long the effects of the pandemic will last. Due to the waxing and waning levels of public health restrictions, family connections have been faced with either forced proximity due to "household bubbles" or forced distance due to physical distancing measures. This enforced change likely affected the internal dynamics of dyads and the overall network organization of the family CAS.

The Mechanism: Family Resilience Models

There are many family resilience models, as the concept of resilience has been applied by researchers studying systems theories, family therapies, child developmental theories, family stress models, family adjustment theories, and psychological resilience research (Distelberg et al., 2015; Maurović et al., 2020; Walsh, 2003). Like FST, many models are theoretical conceptualizations for therapy rather than models designed for empirical research. Maurović and colleagues (2020) highlight that conceptualizing and operationalizing the domains of risk, protective factors, and outcomes of resilience into a singular agreed-upon concept is challenging. In addition, measuring family resilience is problematic because it is an ongoing emerging property of a system that could manifest differently depending on the context and adverse event type, and there are questions about whether it should be measured in single or multiple domains, once or multiple times, or even if the current methodological designs are best suited to study such a complex concept (Lipsitt & Demick, 2012). This section summarizes some prominent models of family resilience and their methods of assessing family resilience.

The most prominent model is Walsh's (1996) family resilience framework. Walsh collated ecological and developmental theories, previous family research on stress, coping, and adaptation, and consistent findings regarding how strong relationships cultivate resilience to develop one of the first models to explicitly use the term 'family resilience' (Walsh, 1996, 2003, 2012). As a clinical psychologist and family therapist, her model focuses on nine key processes that help facilitate and encourage resilience within three domains of family belief systems, family organizational patterns, and communication/problem solving (Walsh, 2003, 2007). The nine key processes include: (1) making meaning of adversity, (2) a positive outlook, (3) transcendence and spirituality, (4) flexibility, (5) connectedness, (6) mobilization of social and

economic resources, (7) clarity, (8) open emotional sharing, and (9) collaborative problem solving (Walsh, 2016). This framework is primarily for clinical applications to help families find their strengths and build on their family resilience. To help measure this concept of family resilience, Sixbey (2005) created the self-report Family Resilience Assessment Scale (FRAS) as a direct assessment measure for the nine key processes in this framework.

Patterson developed the Family Adjustment & Adaptation Response (FAAR) model to describe family resilience as it relates to family stress theory and coping (Patterson, 2002b). It extends from Hill's (1958) ABCX model of family stress and McCubbin and Patterson's (1983) Double ABCX model (as cited in Henry et al., 2015). This model "emphasizes the active processes families engage in to balance *family demands* with *family capabilities* as these interact with *family meanings* to arrive at a level of *family adjustment* or *adaptation*" (Patterson, 2002b, p. 236). Daily, the family system deals with multiple demands or stressors and looks to its capabilities or resources available to maintain the balance (Saltzman et al., 2018). If the stressors pile up too long, they leave the scale unbalanced. They can spiral the family into a crisis, "which is a period of significant disequilibrium, disorganization, and disruptiveness in the family" (Patterson, 2002b, p. 237). Families can restore the balance via a "regenerative power" that either leads to family bonadaptation (that is to say, a resilient outcome) or maladaptation (a vulnerability; Patterson, 2002b). Measuring family resilience using this model often requires assessing each construct via individual measures (Bristol, 1987; LeBaron et al., 2020; Megahead & Soliday, 2013; Xue et al., 2014).

Olson developed the Circumplex Model, which also has adaptability as a key mechanism for family resilience (MacPhee et al., 2015; Olson, 1986; Olson & Craddock, 1980). Olson found that three dimensions of cohesion, change (i.e., adaptability), and communication were the most

common concepts and approaches when analyzing various theoretical models within family research (Olson, 1986). The latest version allows researchers or clinicians to classify family systems into one of 16 types along the adaptability and cohesion dimensions; the communication dimension "facilitates movement of families on cohesion and change" (Olson, 1986, p.338). Researchers can measure family resilience using a 20-item self-report scale called the Family Adaptability and Cohesion Evaluation Scales (FACES-III; Olson, 1986).

While not a standalone model, Benzies and Mychasiuk (2009) performed a systematic review to determine the key protective factors that develop family resilience, organizing protective factors for family resilience according to individual, family, and community levels. At the smallest level, protective factors of the individual to foster family resilience include an internal locus of control, emotional regulation, belief systems, self-efficacy, effective coping skills, increased education, skills and training, health, temperament, and gender. At the family level, protective factors included (categorical) family structure, intimate partner relationship stability, family cohesion, supportive parent-child interaction, stimulating environment, social support, influences from the family of origin, stable and adequate income, and adequate housing. At the community level, it was community involvement, peer acceptance, supportive mentors, safe neighbourhoods, and access to quality schools, childcare, and healthcare all served as protective factors to develop family resilience. Since this was a systematic review, no measures were available to assess this conceptualization of family resilience (Benzies & Mychasiuk, 2009).

Henry and colleagues (2015) propose a Family Adaptive Systems (FAS) framework that can further family resilience research. This framework integrates the concepts of individual resilience, family resilience, and systems theory into consideration. In keeping with process-

oriented definitions, the four basic elements of family resilience are family risk, family protection to enable a restoration of balance, family vulnerability that increases the risk, and short adjustment and long-term adaptation. Instead of family systems, FASs "emerge from family interactions to develop and regulate key domains of day-to-day family life including but not limited to meaning, emotion, control, maintenance, and responses to stress" (Henry et al., 2015, p.24). They posit that these key domains are basic systems in and of themselves within the meta-level of the FAS that work to develop family functioning and resilience. However, this is one of the newer models and there is no method of testing these domains at this time (Henry et al., 2015).

Implications. Due to the complexity of human interactions and family dynamics, there are many ways to conceptualize family resilience. When looking at the many models, it can start to feel like many of the above models treat resilience like an outcome, wherein a set of protective factors or domains can lead to resilience. These conceptualizations do not fully match that of CAS resilience, wherein it is an ongoing property of the system that allows for evolution and growth. However, it is very difficult in CAS theory to conceptualize how to measure an ongoing process of mechanisms that defines a system's resilience.

Here I acknowledge that I am desiring to expand the conceptualization of family resilience beyond what is in family literature, to consider better assessments to measure resilience along Maurović and colleagues' (2020) risk, mechanisms, and outcomes. However, I am limited with the resources at hand to measure such a concept. The existing model that primarily relies on mechanisms or processes within a family that can define resilience is Walsh's family resilience. It also is the most prominent model and has the larger research base.

Nonetheless, it is still an incomplete method that aligns with the way I desire to measure resilience and I hope in the future better methods can be attained.

Family Resilience and COVID-19. I return to the COVID-19 literature to share what has been written regarding the pandemic and family resilience. When attempts to research families were restricted due to lockdown protocols, initial papers regarding family resilience and COVID-19 contained theoretical explanations for how families could cope during the pandemic and how to strengthen and equip families to build resilience during limited mental health services. The pandemic's stressors, complexity, and duration could overwhelm a family system and "undermine typical protective factors" such that there were serious concerns for family welfare (Stark et al., 2020, p. S133). Most of these initial papers were contextualized using previous traumas, including natural disasters, war, and other global crises (Prime et al., 2020). There was little to no supporting empirical evidence to their recommendations and whether they would play out during this global pandemic.

As the pandemic wore on, empirical studies on mental health and well-being of the individual and the family began to appear. Topics included the impact of COVID-19 on anxiety and depression (Barzilay et al., 2020; Luthar et al., 2000), distress symptoms (Miller et al., 2020), living experiences (Langenkamp et al., 2022), parent flexibility and family cohesion (Daks et al., 2020), emotional reactions (Ramadhana, 2020), and building individual resilience (Aruta, 2021; Panzeri et al., 2021). Some simply looked at the COVID-19 impact and family resilience within the geographical and cultural contexts of United States (Rogers et al., 2021), Hong Kong (Zhuang et al., 2021), and Indonesia (Sagita et al., 2020). One paper contained a literature review of these related concepts (Gayatri & Irawaty, 2022).

The most comprehensive study regarding themes of family resilience was that of Eales and colleagues (2021), who used a mixed-method design to study family challenges and resilience of American families with adolescents during the pandemic. They assessed $N = 469$ parents both quantitatively and qualitatively to understand their family experiences during the COVID-19 pandemic. Quantitatively they found all parents reporting varying degrees of impacts of COVID-19 on their family day-to-day lives, family relationships, child's life, family health and security, and coping mechanisms. Qualitatively, they determined six categories of themes: whole family dynamics, sibling dynamics, parent-child dynamics, family routines, social distancing, and coping. While family resilience was not measured directly, Eales and colleagues determined that the presence of children adapting well to their new situations, parents finding positive changes in their child's life, trying to establish new family routines, and parental determination and problem solving skills provided evidence of the promotion of resilience. I found this study the most beneficial because it had the same conceptual framework of resilience and FST, combined the preconceptions from Prime and colleagues (2020) and Masten & Motti-Stefanidi (2020), and offered empirical evidence towards what happened to families within North America, albeit the United States (Eales et al., 2021).

The remaining studies regarding COVID-19 and family resilience primarily focus on Walsh's family resilience framework. Notably, Walsh herself wrote a paper to help families build resilience during COVID-19, of which the best outcomes were to: "(a) contextualize the distress, (b) attend to the challenges, suffering and struggles of families, and (c) strengthen relational processes that support coping, adaptation, and growth" (Walsh, 2020, p. 904). Many studies use the FRAS (Sixbey, 2006), which, as mentioned above, was developed to assess Walsh's nine key processes. Rahayu and colleagues (2021) assessed the effect of social support on family

resilience from the perspective of the spouse or parent in Indonesia and found that 65.9% of individuals reported high family resilience and that social support (from within the family and also externally from friends or others) accounted for 29.2% of the variance. Zhuang and colleagues (2021) sought to assess protective factors from the psychological distress of vulnerable families in Hong Kong from COVID-19 stressors, using only the utilizing social resources subscale of the FRAS. Results revealed that 42% of adult respondents reported moderate to severe psychological distress, with family support, indoor leisure activities, and community resources mediating the stressors' influence on the family (Zhuang et al., 2021).

Summary. Family resilience has many models and conceptualizations based on different emphases, so it is essential to understand how research operationally defines this term. In addition are various methods and means to measure family resilience, often measuring each key domain within the model separately. While several studies assessed family resilience in the context of COVID-19, the most theoretically-sound studies focus on Walsh's family resilience framework. None have yet been done in Canada, nor have they emphasized the role of family connections in this resilience framework. Additionally, these studies have been performed on families with children or adolescents, not emerging adults. This study would complement these two gaps in the existing COVID-19 family resilience research, using Walsh's framework of family resilience under the lens of CAS theory and Maurović and colleagues' (2020) definition. Nevertheless, this lays a good foundation and helps us develop a sound understanding of measuring family resilience and family connections.

The Outcome: Family Satisfaction

The last portion of Maurović and colleagues (2020) definition of family resilience enquires of the good outcome or bonadaptation following a risk. While the most common is

family functioning or fulfillment of family functions, there is conflicting research when it also can operationalize the protective factors or mechanisms. This was indicated too in the fact that many measures of family functioning appear to imitate those that measure family resilience due to many shared mechanisms between these two constructs. Maurović and colleagues suggest another outcome that would be suitable for family resilience studies: satisfaction with family life. How satisfied individuals are with their family is more distinct from how well the family functions, whether measuring after a risk like family resilience, or in general like family functioning (Maurović et al., 2020).

Summary

This section provided an overview of existing family resilience research. I lean into Maurović and colleagues' (2020) definition of the risk, processes, and outcome, which can be supported throughout the existing family resilience research. Yet, I agree with Maurović and colleagues who conclude that, "family resilience is not easy to understand and research" (p.350, 2020). This concept can have a range of operational definitions, and it is uniquely tough to measure family-level concepts when families come in so many different shapes and sizes. Although measuring familial processes using self-report measures from the individuals is one of the more common and easier methods to assess resilience, it only provides the perspective from a single agent of the system, which may be perhaps not a wholesome and accurate picture. This is not a struggle only within family resilience; measuring CAS resilience is equally as challenging.

If the purpose of this study is to understand how to assess family resilience, it might be best to address it in two different ways. The first is following along the lines of pre-existing family research; specifically, following Maurović and colleagues (2020) pathway of the moderating process of resilience on a risk. Here, I have described in detail the risk, which is the

COVID-19 lockdown period, and have focused the CAS of study on emerging adults and their families of origin. Thinking back to the CAS adaptive renewal cycle, my operating definition for family resilience has addressed resilience (family resilience's mechanisms or processes) and potential (family functioning). This final upcoming portion within the literature review considers how connectedness, by way of family connections, could impact family resilience if they are known to be in fluctuating levels with each other.

Connections in the System

Connections are another emergent property of a system because they exist between or among agents, aggregates, or levels. However, there are many ways to look at connections, of which lead to different conclusions or results. This section only briefly begins to cover the literature base of connections within both CAS systems and family systems.

Connectivity or Connectedness in CAS

While many CASs are unique, there are some similar features to consider. Connections within a component are often stronger than connections across different components (Eidelson, 1997). Connections are often bidirectional in a CAS, which promotes more interrelationships rather than cause-and-effect unidirectional relationships (Bucknall & Hitch, 2018). "By identifying the connections … and examining their relationships, researchers can measure the flows that push complex adaptive systems in and out of equilibrium" (Burger et al., 2021, p.14). Categorizations to analyze connections include by a specific type (e.g., agent-agent or agent-aggregate), strength, direction, frequency, and quality (Eidelson, 1997). Turnbull and colleagues (2018) differentiate between structural connectivity, which has to do with the organizational configuration, versus functional connectivity, which has to do with the dynamic processes of the

connection. Unfortunately, much of the CAS literature typically focuses on the connectivity of the system rather than focusing on one particular type of connection.

The adaptive renewal cycle helps explain how the level of connectedness of the whole CAS can affect the stability and phase of the system. There needs to be a healthy amount of connectivity in a network. Too little connectedness can lead to poor adaptive responses when a CAS is experiencing a problem, but too much connectedness leads to too many conflicting inputs and can make the system too rigid to respond (Eidelson, 1997). Therefore, connectedness from the adaptive renewal cycle is solely concerned with the internal stability or rigidity of connections within the CAS.

The Role of Family Connections

There have been many ways to conceptualize and assess family connections within the system. Within family research, connections have been assessed via concepts such as family connectedness (Ferriby, 2015; Markham et al., 2003; Mason, 2016), family cohesion (Olson & Craddock, 1980; Vandeleur et al., 2009), family communication (Akhlaq et al., 2013; Carr & Kellas, 2018; Kouneski, 2000; Leustek & Theiss, 2020), and social support (Parker et al., 2021; Zhuang et al., 2021). Some of these terms focus only on connections' quantity, frequency, or strength. Some researchers measure different types of connections, such as verbal communication, nonverbal communication, virtual communication, emotional connections, involvement, attachment, conflict, and so forth (Furukawa & Driessnack, 2013; Givertz & Segrin, 2014; la Valley & Guerrero, 2012; Saltzman et al., 2018; Strouse et al., 2021; Zhen et al., 2021). Often research either focuses on a property that considers the family system as a whole or a specific subsystem such as a parent-child dyad (Ferriby, 2015; Murray, 2006).

Dyads are the most common due to the ease in collecting data and the detailed information gathered when only looking at two individuals. The most common types are the parent-child dyad, the parent-parent dyad, and the sibling-sibling dyad (Ferriby, 2015; la Valley & Guerrero, 2012; Zvara et al., 2018). Each dyadic interconnection between two members is unique, such as different interactions between father-child and mother-child (Zvara et al., 2018). Focusing on dyads, self-reports or interviews with each member provides their unique perspective of the connection (Ferriby, 2015).

When taking a holistic perspective of the family, we lose the descriptive qualities of each connection, but we gain a more collective understanding of how these connections interplay within a system. Since the family system is very interconnected, just looking at one dyad in isolation may overlook the impacts that the other family members have on that connection (Chopik et al., 2022). Researchers are best able to measure holistic perspectives through interviews involving the whole family (Bell & Bell, 2009; Jacobson & Rowe, 1999; Schadler, 2016). However, many researchers use self-report measures from a single family member, recognizing that this is a limited perspective of the family (Furukawa & Driessnack, 2013; Mason, 2016; Strouse et al., 2021; Szcześniak & Tułecka, 2020; Zhen et al., 2021). This is because it takes only one member without getting perspectives of other members, and how the family acts together rather than individuals in isolation.

Family Connections in Emerging Adulthood

The existing literature regarding young adults' connections primarily focus on dyads within their family system. Some look at parent-youth dyads, wherein the frequency of contact, leisure, conflict, and physical displays of affection decrease (Lindell & Campione-Barr, 2017), but the overall relationship quality remains positive and even increases between mother-youth

(Memmott-Elison et al., 2021). When looking at sibling dyads, again, the frequency of different types of connections decreases, but the quality, such as emotional support, intimacy, and instrumental aid, increases (Lindell & Campione-Barr, 2017). However, many papers acknowledge the importance of looking at the whole system because "changes in one subsystem are likely to reverberate in other family subsystems" (Chopik et al., 2022; Whiteman et al., 2011, p.3). Nonetheless, continuity and change are present in young adults' relationships with their family members (Whiteman et al., 2011).

Family Connections in Family Resilience

All models of family resilience acknowledge the role of connections directly or indirectly. Walsh and Olson's models include explicit mention of a domain for member communication within their models. Walsh has regularly emphasized the importance of significant relationships on resilience (Walsh, 2016). Unlike FST, which can focus on dyads, family resilience tends to emphasize the collective network of connections within the family, whether it be the cohesiveness (analogous to the overall strength of connections), communication (type of connection), or connectedness (quantity or quality of connection). Many of the family strengths and the system's collective ability to develop resilience relies on the interaction of various connections among members and the emergence of properties and family dynamics from the entire system.

Summary

CAS theory and family research both emphasize connections. Both CAS theory and family resilience focus on higher-level measurements or understanding of connections. There are many family-level measures to assess higher-level connections. However, leaving the understanding of connections at this higher-level deprives the rich information that can be drawn

from other family literature, notably dyadic subsystems. While there is research on overall family connectedness on family resilience, no existing study has focused on the role of the quality and strength of dyadic connections on family resilience. To complement the work done by Lindell and Campione-Barr (2017), it would be interesting to measure both the dyadic understanding of connections. The system-wide understanding of connections could be attained through their average to determine a system-wide connections. This might shed some light on the association between resilience and connectedness within the adaptive renewal cycle, all the while conforming to existing family literature.

Purpose of the Current Study

No study to date has used both a CAS adaptive cycle and family development framework to understand family resilience. Since resilience defines the survival of a CAS, it would be indispensable to analyze how resilience would help the family of origin system to succeed after facing changes amidst the COVID-19 pandemic. Variations in connectivity help drive a CAS through the adaptive cycle, so I also wanted to look at individual connections and the overall level of connectedness within the family system during this time and whether there is a similar association between connections and resilience similar to that found in the adaptive renewal cycle.

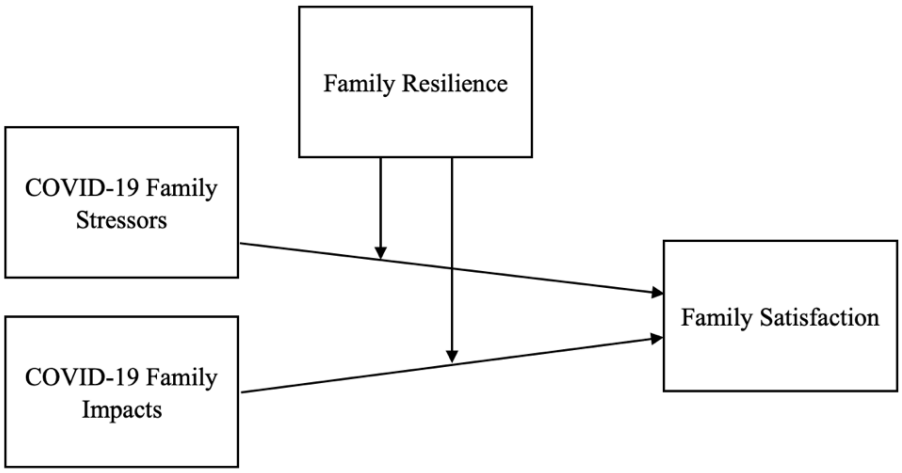
Therefore, as stated earlier, the purpose of this study is to examine the family systems process of resilience considering two frameworks: the first alongside existing psychological research in the COVID-19 context, and the second by incorporating a CAS concept of connectedness within the family. The focus was on the emerging adult's perspective of family resilience and connections within the family of origin. This study had two separate aims, as follows.

First Aim

The first aim was to examine family resilience using the risk, the mechanisms, and the outcome as described in the introduction: COVID-19 impact on the family, factors within family resilience, and family satisfaction (see Figure 6). Assessing COVID-19 impact can be split into two different conceptualizations, the number of stressors faced and how family life was affected by these stressors; therefore, there will be two independent variables of COVID-19 family stressors and COVID-19 family impacts. The dependent variable is family satisfaction. Family resilience mechanism act as a moderator among this relationship. I first hypothesize a negative correlation would occur between both COVID-19 stressors and COVID-19 family impacts and the level of family satisfaction. When family resilience is added to the model, it would moderate these stressors' effect on family satisfaction, such that both COVID-19 stressors and COVID-19 family impacts would be negatively associated with family satisfaction only when family resilience is low. When family resilience is high, COVID-19 stressors and COVID-19 family impacts would not be significantly associated with family satisfaction.

Figure 6

Planned Path Model Diagram for the First Aim of the Study



Second Aim

The second aim of the study was to examine the relationship between family connectedness and family resilience. Family connectedness was measured by way of collective dyadic family connections, and I measured the number of connections plus the strength and valence (quality) of each connection. Family resilience was treated as a dependent variable to see what effect different family connections had. Since we were looking at a unique feature of connections on resilience, this aim was exploratory in nature such to unpack this relationship. Therefore, no specific hypotheses were created. Figure 7 shows the proposed path diagram for the main model, with the intent of performing multiple post-hoc exploratory analyses to generate hypotheses for future research.

Figure 7

Planned Path Model Diagram for the Second Aim of the Study

Methodology

Participants

For the current study, a convenience sample came from the Lakehead University community in Thunder Bay, Canada. Eligibility criteria consisted of: age between 18-29, which coincides with the typical age range describing emerging adults; the ability to speak and read English; currently residing in Thunder Bay, Ontario or the surrounding district since March 2020 (to control the variety of unsynchronous public health measures issued throughout Canada); and current contact with at least one living family member. To seek a medium effect size of $f^2 = .15$, an alpha of $\alpha = .05$, and a power of $\beta = .08$, a minimum of 143 participants was determined by

the G*Power program (version 3.1.9.6) to have sufficient power for the largest multiple regression analysis in our study.

Procedure

For the current study, a convenience sample was taken from the undergraduate psychology student pool at Lakehead University in Thunder Bay, Canada. Following ethics approval by the Lakehead University Research Ethics Board, participants were recruited via posters (see Appendix A) and the Lakehead University SONA management system (see Appendix B), an online portal for undergraduate psychology students to sign up for research studies. Potential participants were directed to a hyperlink for the SurveyMonkey study information and survey. After reading through the introduction and consent forms (see Appendix C), they chose whether to agree to participate and then responded to a series of questionnaires. At the end of the study, the participants were provided with a debrief form (see Appendix D) and a separate link to collect their email addresses for a chance to win a CAD 30.00 gift card to SkipTheDishes.com.

Materials

Demographics Questionnaire

A two-part questionnaire was created to ask about participants' demographic and family information (see Appendix E). The demographic portion included items regarding age, gender, ethnicity/race, education level, occupational status, current living situation, annual household income, and birth order in their family. Due to small cell sizes, gender and ethnicity data were collapsed into fewer groups.

A family portion assessed the current number of members the participant considered part of their family of origin and with whom they currently have contact (ranging from one to ten).

The family of origin was defined as "those who raised you and who you were with during childhood. Members do not have to live in the same household or have been present the entire time. Members do not have to live in Thunder Bay." Participants then had to describe the relationship of each member (e.g., mother, sibling 2, foster father, grandmother) and if they lived with any of these members between March 2020 to March 2022 (with the response options "Yes the entire time," "Yes for some of the time," or "No").

Family Connections

The Network of Relationships Inventory - Relationship Qualities Version (NRI-RQV) is a 30-item questionnaire that assessed self-perceptions of the frequency, strength, and quality of the participant's relationships (Furman & Buhrmester, 2010). The items are normally rated on a 5-point Likert-type scale ranging from 1 (*never or hardly at all*) to 5 (*always or extremely much*) and were grouped into two factors, Closeness and Discord, which I refer to as positive and negative domains. Both factors have five subscales; Companionship, Intimate Disclosure, Satisfaction, Emotional Support, and Approval are within the Closeness or positive domain; Pressure, Conflict, Criticism, Dominance, and Exclusion are within the Discord or negative domain. For this study, the 5-point Likert-type scale was transformed to range from 0 (*never or hardly at all*) to 4 (*always or extremely much*) to allow for a zero value to mean a distant or nonexistent connection. The original questionnaire includes six different relationships: a same-sex friend, an opposite-sex friend, a romantic partner, one sibling, and each parent. Our use of this measure allowed between one to ten family members; therefore, the participants completed the questionnaire once per family member (see Appendix F). The NRI-RQV was intended initially for adolescents, yet studies involving adults have found an internal consistency reliability coefficient of $\alpha = .95$ for the overall measure (Guvensel et al., 2018), and .89 and .91

for the Closeness and Discord factors, respectively (Chow et al., 2014). Additionally, since the original version is intended for adolescents living with their family members, the Demographic Questionnaire asked whether the participant lived with each family member presently or at all during the COVID-19 lockdown period.

COVID-19 Changes in the Family

The COVID-19 Exposure and Family Impact Survey, Adolescent and Young Adult Version (CEFIS-AYA) is a self-report questionnaire that measures exposures to COVID-19-related stressors and their impacts on the participant and their family life (Kazak et al., 2020). Two parts of the CEFIS-AYA were used (see Appendix G): Part 1 consisted of 28 items with dichotomous yes/no responses for exposure to COVID-19 and related events; Part 2 consisted of 16 items with 4-point Likert-type responses from 1 (*made it a lot better*) to 4 (*made it a lot worse*) regarding the impact of COVID-19 on the participant's and family's life. Parts 1 and 2 coincided with our variables COVID-19 family stressors and COVID-19 family impact, respectively. Part 1, or COVID-19 family stressors, was an accumulated sum ranging from 0 to 28. Part 2, or COVID-19 family impact, was a mean average of scores. The internal consistency reliability coefficients for Parts 1 and 2 were Cronbach alphas of α =.80 and α = .92, respectively (Kazak et al., 2021).

For this study, the frame of reference for COVID-19 was limited to the lockdown periods within Thunder Bay, which interspersed between March 11, 2020, and March 28, 2022, the date that the *Reopening Ontario Act* (2020) expired and when most of the public health restrictions were lifted. After this date, the number of individuals symptomatic or diagnosed with COVID-19 increased substantially, and the stigma and fears of getting COVID-19 were reduced.

Family Resilience

Consistent with prior literature, the Family Resilience Assessment Scale (FRAS) was used to assess family resilience (see Appendix H; Sixbey, 2005). The FRAS was designed to ask about the whole family system as the participant reflects on a particular event without explicitly addressing its details (Sixbey, 2005). The FRAS questionnaire contains 54 items within six factors: Family Communication & Problem Solving, Utilizing Social & Economic Resources, Maintaining a Positive Outlook, Family Connectedness, Family Spirituality, and Ability to Make Meaning of Adversity. The items are rated on a 4-point Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly disagree*), with four items using reverse scoring. The original nine-factor model of the FRAS, which aligned best with Walsh's nine key processes, had Cronbach's alphas for each factor ranging from .43 to .90 (Sixbey, 2005); therefore, a more robust 6-factor model was created and used in this current study that demonstrated a full-scale internal consistency of $\alpha = .96$ and subscales ranging between .70 to .96 (Sixbey, 2005). Data consisted of the overall average of the FRAS as well as averages for each factor.

Family Satisfaction

The Beach Center Family Quality of Life Survey (QoL) is a 25-item questionnaire regarding family satisfaction and quality of life (Park et al., 2003). The items are rated on a 5-point Likert-type scale ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*). It was initially designed to assess families who have a member with disabilities, consisting of five subscales. This study used 16 items corresponding to three applicable subscales (see Appendix I): Family Interaction, Emotional Well-Being, and Physical/Material Well-Being. These subscales have internal consistency reliability coefficients of .85, .83, and .64, respectively (Hoffman et al., 2006). Although the Physical/Material Well-Being scale has a lower internal consistency reliability coefficient, a second sample found higher internal reliability coefficients specifically

regarding the satisfaction (α = .74) and importance (α = .81) of this subscale (Hoffman et al., 2006). Additionally, these researchers found good to excellent fits for each subscale and the overall scale structure, significant test-retest reliability correlations, and convergent validity with other family satisfaction measures (Hoffman et al., 2006). For this study, the data consisted of the mean average of scores.

Qualitative Item

The original CEFIS-AYA contains a final Part 3 that consists of a singular open-ended item to provide any additional responses regarding the COVID-19 impact on the family. As an alternative, this study used a singular open-ended item written as (see Appendix J): "Please provide any additional comments or thoughts relevant to the COVID-19 impact on your family, your connections with these family members, or how satisfied you are with your family-of-origin." The responses to this item were categorized and sorted into themes to add additional qualitative depth to the data.

Planned Analyses

All analyses were conducted using IBM SPSS (version 28).

Data Cleaning

Prior to analyses, data screenings were carried out to examine missing data and outliers. Listwise deletion occurred for participants who were missing entire scales would be removed. Next, univariate outliers were removed if they were three or more standard deviations from the mean, and multivariate outliers were assessed via calculating Mahalanobis distances (Leys et al., 2019). Case mean imputation, using the participant's mean of the subscale within the measure, was utilized when a study variable contained up to 20% of missing items (Roth et al., 1999).

Family of Origin Characteristics

Each family member listed by the participant was coded on the relationship type (e.g., mother, father, grandfather, or stepmother, depending on the responses provided). Additionally, a new indicator independent variable called family structure was created from the most frequent types in the data (e.g., two biological parents, single-parent, adoptive, or only child, again depending on the size and variation of responses) to use as a covariate.

Demographic Variable Analyses

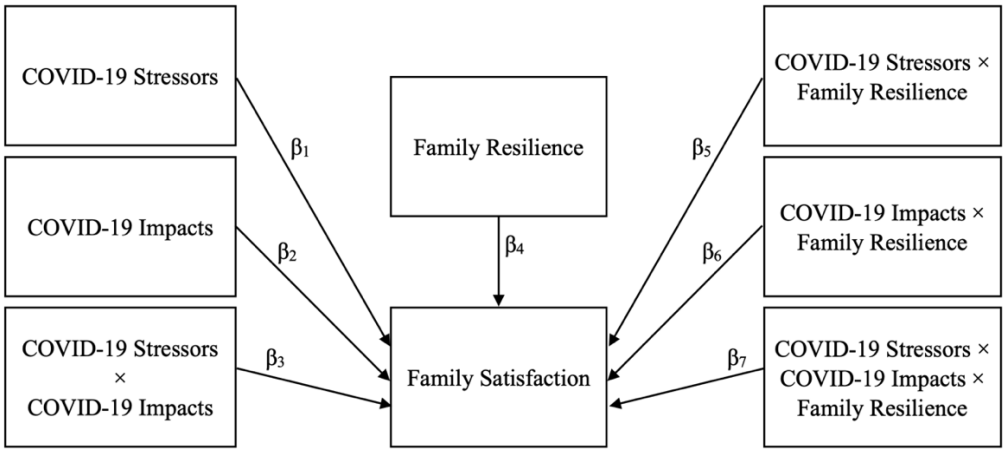
Descriptive statistics were gathered of all demographic variables. These variables were chosen based on their relevance for test-taking and family research, but further analyses determined their applicability as covariates. To determine whether continuous demographic variables (e.g., age and family size) were significant predictors, a correlation matrix was conducted including the relevant demographic variables and the study variables. For categorical demographic variables (e.g., gender, ethnicity, occupation, education, household annual income, living status, birth order, family structure), multivariate analyses of variances (MANOVAs) was conducted with the study variables as the dependent variables and each demographic variable as a standalone predictor variable. Covariates were assigned to each study aim through significant correlations with the study variables.

Study Variable Analyses

Descriptive statistics were gathered of all study variables, namely COVID-19 family stressors, COVID-19 family impact, family resilience, family satisfaction, and individual family member connections. Each variable was assessed for internal reliability using Cronbach alphas. A Pearson correlation matrix was developed across study variables to assess for collinearity, and regression models included collinearity diagnostics.

Figure 8

Planned Hierarchical Regression Model to Assess Moderation for the First Aim of the Study



Model equation:

$$Family\ Satisfaction = \beta_0 + \beta_1(COVID\text{-}19\ Family\ Stressors) + \beta_2(COVID\text{-}19\ Family\ Impacts) + \beta_3(COVID\text{-}19\ Family\ Stressors)(COVID\text{-}19\ Family\ Impacts) + \beta_4(Family\ Resilience) + \beta_5(COVID\text{-}19\ Family\ Stressors)(Family\ Resilience) + (COVID\text{-}19\ Family\ Impacts)(Family\ Resilience)\ ) + \beta_8(COVID\text{-}19\ Family\ Stressors)(COVID\text{-}19\ Family\ Impacts)(Family\ Resilience) + e$$

Note. Independent variables are organized in terms of the three steps, where the first row is added in the first step, then the second row (family resilience) is added in the second step, and the third row is added in the third step.

First Aim Analyses

To examine our first aim, a three-step hierarchical multiple regression analysis using the ordinary least squares (OLS) method tested at the $p < .05$ level was conducted to assess the moderation of family resilience. The two independent variables were COVID-19 family stressors and COVID-19 family impacts, the moderator was family resilience, and the dependent variable was family satisfaction. The covariates included any of the demographic variables that are significantly correlated with any of the study variables. Interaction variables were computed from COVID-19 stressors and COVID-19 impact; COVID-19 stressors and family resilience; COVID-19 impact and family resilience; and COVID-19 stressors, COVID-19 impact and family resilience. The resulting statistical model, with the steps laid out by each column, is in Figure 8. Attention was focused on the overall model F value, the R^2 change, and the variables'

coefficients that include family resilience. If at least one coefficient was significant from interaction variables that include family resilience, then moderation was supported, and further analyses were conducted to partial out and define this moderation would occur (Hayes, 2022; Wong, 2016).

Second Aim Analyses

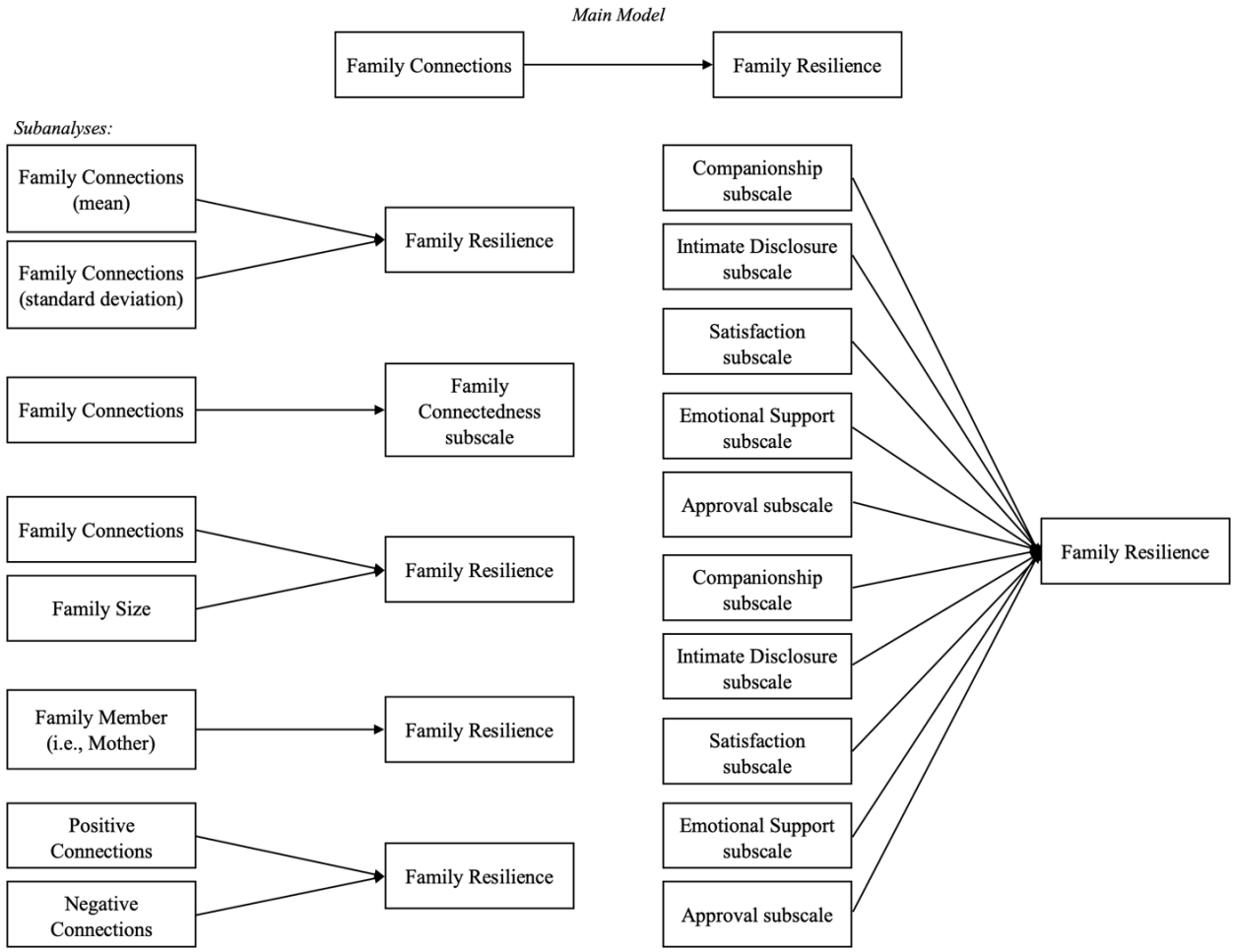
Since the second aim was exploratory, multiple analyses were performed. While multilevel modelling (MLM) would have been optimal because it allows for nested data, such as multiple dyadic scores being nested under one participant, the dependent variable was a nested-level outcome variable, and this goes against conventional MLM (which uses individual-level outcome variables; Silva, 2007). Instead, Foster-Johnson and Kromrey (2018) recommend an OLS regression using the group mean of the independent variable with White's heteroscedasticity adjustment would be sufficient to address a nested-level outcome.

Therefore, the independent variable for this second aim was the mean of all family member's connections, averaged as a single score for each participant. The dependent variable remained as family resilience. The covariates included any demographic variables significantly correlated with any of the study variables. An OLS regression model with White's heteroscedasticity adjustment was tested at the $p < .05$ level (Figure 3).

Since this was an exploratory aim, this model served as the primary analysis, and additional post hoc exploratory analyses were developed to further understand the data (Hollenbeck & Wright, 2017). These additional analyses were derivatives of the primary analysis's main model, so they included the same type of OLS regression model with the same covariates and at the $p < .05$ level. Six categories of analyses were predetermined to help guide the post hoc analysis plan (see Figure 9).

Figure 9

Planned Statistical Model Iterations for the Exploratory Second Aim of the Study



To understand the variance within the mean of family connections, the standard deviations of participants' family connections was added to the main model. To compare family connections with just the subscale Family Connectedness within the FRAS, the dependent variable was replaced from overall family resilience with the family connectedness subscale. To understand the complexity of different family sizes, this continuous independent variable was added to the main model. To understand the relationship of specific family members (e.g., mother), those types were run in the model instead of the participant's mean of all connections. Separate analyses were run for each family member. Participant datasets whose responses did not

apply to the relevant categorizations (e.g., they do not have a mother listed as a family member) were excluded from these analyses, meaning that there were different sample sizes for each of these respective analyses. Lastly, to understand the type of connections, various sub-analyses were performed regarding the factors and subscales of the NRI-RQV, splitting up the main factors. The Positive connections (the Closeness factor) and Negative connections (the Discord factor) acted as the independent variables from the main model in one analysis. The means of the five subscales of the Positive connections and the five subscales of the Negative connections became the independent variables in another analysis.

Qualitative Item Analysis

The responses to the qualitative item were coded and then developed into themes using inductive reflexive thematic analysis, following the steps as outlined by Clarke and Braun (2006). This item was intended to help clarify participants' responses or to allow them to offer reflections or other contextual information they felt necessary to share.

Results

Analytic Sample

A total of 190 participants completed the survey. Data was first cleaned and organized. Listwise deletion occurred for 7 participants who did not meet eligibility criteria, 23 who had missing items for an entire measure, 10 who had 20% or more missing items within a specific measure, and 1 who was deemed a multivariate outlier. The resulting data set included $N = 149$ participants and was used for both study aims.

Family of Origin Statistics

Each family member was coded into a variable called Relative under the following categories: father, mother, sibling, step-relative, grandparent, other adult (e.g., aunt, neighbour,

godparent), and other child (e.g., cousin, nephew, boyfriend). The most frequent family members indicated were mother (98.0% of all participants' families), father (88.6%), and sibling (83.2%). These statistics and information regarding family members' living statuses is in Table 1.

Table 1

Participant's Family Members and their Living Status with the Participant.

Relative	Total		Living none of the time		Living some of the time		Living the entire time		Missing	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Mother	146	98.00	65	44.50	36	24.70	41	28.10	4	2.70
Father	132	88.60	60	45.50	25	18.90	44	97.70	3	2.30
Sibling	124	83.20	66	30.00	61	27.70	87	39.50	6	2.30
Grandparent	49	32.90	41	44.10	15	16.10	36	38.70	1	1.10
Step-Relative	20	13.40	9	28.10	9	28.10	10	31.30	4	12.50
Other Adult	27	18.10	26	45.60	10	17.50	21	36.80	0	0.00
Other Child	18	12.10	4	14.30	6	21.40	17	60.70	1	3.60
Unlabeled	2	.01	0	.00	0	.00	0	.00	2	.01

A new indicator independent variable called Family Structure was created from the make-up of family members (see Table 2). All participants' family structures fell into the following categories: single-parent family, nuclear family (one mother and one father), extended family (at least one parent plus grandparent(s)), blended family (at least one parent plus step-relative(s)), additional family (at least one parent plus other adult(s) not described in the above categories), and no parents family structure.

Table 2

Number and Percentages of Participants by Family Structure Categories.

Family Structure	*N*	%
Single Parent Family	5	3.40
Nuclear Family	75	50.30
Extended Family	24	16.10
Blended Family	15	10.10
Additional Family	27	18.10
No Parents Family	3	2.00

Demographic Variables Statistics

While detailed tables of demographic descriptive statistics can be found in Appendix K, the following summarizes the average demographic information collected. The average participant was 20.89 years of age (*SD* = 2.64), female (72.5%), of European descent (71.8%), was currently studying with full-time employment (43.0%) and had completed some post-secondary schooling (49.7%). The average participant lived with their family (59.1%), and the annual household income was $24,999 or less. Respondents were most often the eldest child (38.9%) in a nuclear family (50.3%) of an average of 4.85 members (*SD* = 2.39) plus themselves.

The Pearson *r* correlations for the continuous demographic variables on the study variables are found in Table 3. Age demonstrated a small negative correlation with family resilience, $r = -.17$, $p = .04$, and with family satisfaction, $r = -.17$, $p = .04$. As age increased, the participant's perception of family resilience and family satisfaction decreased. Participant's family size had a small negative correlation with their average family connection, $r = -.20$, $p = .01$, and a small positive correlation with family resilience, $r = .24$, $p < .01$. This means that as

family size increased, the frequency of family connections decreased, and the perception of family resilience increased.

Table 3

Correlations via Pearson r for Continuous Demographic Variables.

Variable	NRI-RQV	CEFIS-AYA Part 1	CEFIS-AYA Part 2	FRAS	QOL
Age	-.09	.05	-.01	-.17*	-.17*
Family Size	-.20*	-.12	.11	.24**	-.14

Note. NRI-RQV = Network of Relationships Inventory – Relationship Qualities Version, CEFIS-AYA = COVID-19 Exposure and Family Impact Survey, Adolescent and Young Adult Version, FRAS = Family Resilience Assessment Scale, QOL = Beach Center Family Quality of Life Survey.
* $p < .05$, ** $p < .01$

MANOVA *F*-tests for the categorical demographic variables were conducted to determine covariates, with the study variables as the dependent variables and each demographic variable as a standalone predictor variable (see Table 4). The MANOVA with gender as the predictor variable had a significant effect on COVID-19 family stressors, $F(3,148) = 3.26$, $p = .02$. The MANOVA with ethnicity showed a significant effect on COVID-19 family impacts, $F(4,148) = 3.38$, $p = .01$. The MANOVA that included family structure was statistically significant with family connections, $F(5,148) = 3.41$, $p < .01$, COVID-19 family stressors, $F(5,148) = 4.82$, $p < .01$, and family satisfaction, $F(5,148) = 2.48$, $p = .03$. The significant effects imply interactions among these specific demographic variables and the respective study variables, which could affect the statistical results of the main study.

Table 4

MANOVA Results (F-Tests) for Categorical Demographic Variables.

Variable	NRI-RQV	CEFIS-AYA Part 1	CEFIS-AYA Part 2	FRAS	QOL
Gender	.16	3.26*	1.29	1.11	.95
Ethnicity	.59	1.30	3.38*	1.47	.84
Occupation	.85	.51	.51	.43	1.09
Education	.20	.75	.53	.49	1.05
Annual Income	1.32	1.33	.85	1.10	1.49
Living Status	2.34	0.36	1.00	.68	.63
Birth Order	.26	0.57	.68	.99	.89
Family Structure	3.41**	4.82**	1.28	.84	2.48*

Note. MANOVAs = multivariate analyses of variance, NRI-RQV = Network of Relationships Inventory – Relationship Qualities Version, CEFIS-AYA = COVID-19 Exposure and Family Impact Survey, Adolescent and Young Adult Version, FRAS = Family Resilience Assessment Scale, QOL = Beach Center Family Quality of Life Survey.
* $p < .05$, ** $p < .01$

Therefore, the following covariates were used in the upcoming analyses. The first aim used the COVID-19 changes, family resilience and family satisfaction as study variables, so age, family size, gender, ethnicity, and family structure variables were chosen as covariates. The second aim used family connections and family resilience as study variables, so age, family size, and family structure were chosen as covariates.

Study Variables Statistics

Descriptive statistics for all study variables, including Cronbach alphas, are found in Table 5. Note that the variable, COVID-19 family impacts, was centered so that a value of 0 indicated no impact, a negative value indicated the impact was worse, and a positive value indicated the impact was better. Most variables had a good internal consistency between $\alpha = .86$ to .96, except for CEFIS-Part 1 at .70.

Table 5

Descriptive Statistics for Study Variables.

Study Variable	*M*	*SD*	*α*
NRI-RQV	1.59	.44	.92
CEFIS-AYA Part 1	12.17	3.65	.70
CEFIS-AYA Part 2	-.02	.71	.86
FRAS	2.76	.41	.96
QOL	3.83	.68	.92

Note. NRI-RQV = Network of Relationships Inventory – Relationship Qualities Version, CEFIS-AYA = COVID-19 Exposure and Family Impact Survey, Adolescent and Young Adult Version, FRAS = Family Resilience Assessment Scale, QOL = Beach Center Family Quality of Life Survey.

A Pearson correlation matrix was developed across study variables to assess for collinearity (see Table 6). Significant correlations include: a small positive correlation between family connections and family resilience, $r = .26$, $p < .01$, family connections and family satisfaction, $r = .19$, $p = .02$, and COVID-19 family impacts and family satisfaction, $r = .18$, $p = .01$; a medium negative correlation between COVID-19 family stressors and COVID-19 family impact, $r = -.45$, $p < .01$; a medium positive correlation between COVID-19 family impact and family resilience, $r = .36$, $p < .01$; and a strong positive correlation between family resilience and family satisfaction, $r = .80$, $p < .01$.

Table 6

Correlation Matrix of Pearson r Values Between Study Variables.

	NRI-RQV	CEFIS-AYA Part 1	CEFIS-AYA Part 2	FRAS	QOL
NRI-RQV		.15	-.03	.26**	.19*
CEFIS-AYA Part 1			-.45**	-.14	-.14
CEFIS-AYA Part 2				.36**	.18*
FRAS					.80**
QOL					

Note. NRI-RQV = Network of Relationships Inventory – Relationship Qualities Version, CEFIS-AYA = COVID-19 Exposure and Family Impact Survey, Adolescent and Young Adult Version, FRAS = Family Resilience Assessment Scale, QOL = Beach Center Family Quality of Life Survey.
* $p < .05$, ** $p < .01$

First Aim

The three-step hierarchical regression was not conducted as planned. The correlation between family resilience and family satisfaction of $r = .80$ was too strong to continue with analyses. Though this value is not greater than the typical cut-off for collinearity of .90 (Norman & Streiner, 2008), and the fact that collinearity only exists among independent variables and not between independent and dependent variables, a conceptual issue exists with running this regression model. These two variables may be measuring the same construct, confounding the moderation hypothesis. All following analyses under this aim were then halted as well.

Second Aim

As this aim was designed to contain post-hoc exploratory analyses, the purpose was to generate hypotheses to understand the relationship between family connections and family resilience. Most of the planned analyses were conducted as usual and supplementary analyses were also designed. The order of these analyses was then restructured and reorganized into four

categories: the primary analysis, including the variance of connections into the analysis, splitting the measures by their factors or subscales, and exploratory subgroup analyses.

Primary Analysis

The main OLS regression model consisted of a group mean of each participant's family connections as the independent variable and family resilience as the dependent variable (as shown previously in Figure 7). Again, the covariates for this model were age, family size, and family structure, with this final variable separated into multiple indicator variables to account for its categorical nature. This model was significant, $F(8,148) = 3.87$, $p < .01$, $R^2 = .18$ (see Table 7). Average family connections was a significant predictor, $b = .29$, $t(148) = 3.67$, $p < .01$. This suggested that as overall family connections became more frequent, perceptions of family resilience were higher.

Family size was initially supposed to be a separate analysis, but it was now included as a covariate in this regression model. Its coefficient within the model was a significant predictor of family resilience, $b = .05$, $t(148) = 2.61$, $p = .01$. This suggests that as family size increases, the perception of family resilience also increases. However, the other covariates demonstrated nonsignificant results: neither age, $b = -.01$, $t(148) = -.97$, $p = .33$, nor the indicators of family structure (b coefficient values ranging from -.18 to .13 and p ranging from .33 to .87) were significant.

Adding the Variance of Family Connections

To understand the variance within the mean of family connections, the standard deviations of participants' family connections were added to the main model (see Figure 10 and Table 7). This was to account for families having similar averages for strengths of connections, but differences in the spread or variance within the average. This model was significant, $R^2 = .21$,

$F(9,145) = 3.92$, $p < .01$. However, while the mean average ($M = 1.59$) of family connections was significant, $b = .29$, $t(145) = 3.57$, $p < .01$, the variance ($SD = .44$) across participant's family connections was not, $b = -.18$, $t(145) = -1.16$, $p = .25$. This suggested that variance did not bear significant weight in the overall significance of the model, meaning that emerging adults with varying strengths of dyadic connections were not significantly correlated with changes in family resilience.

Figure 10

Model Derivative with the Mean and Standard Deviation of Family Connections.

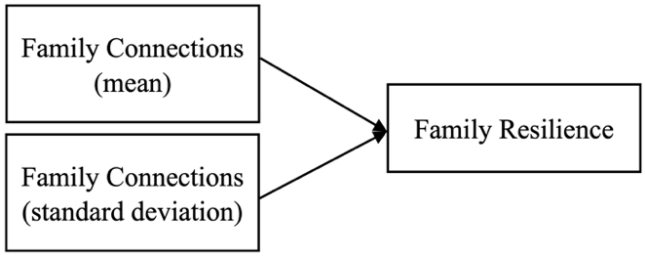


Table 7

Model and Coefficient Statistics for Family Resilience Mean and Variance Models.

Independent Variable(s)	Model			Coefficient(s)			
	F	*p*	R^2	Type	*b*	*t*	*p*
NRI-RQV mean	3.87	<.01**	.18	*M*	.29	3.67	<.01**
NRI-RQV mean + NRI-RQV variance	3.92	<.01**	.21	*M*	.29	3.57	<.01**
				SD	-.18	-1.16	.25

Note. NRI-RQV = the Family Connections scale, Network Relationships Inventory – Relationship Quality Version, ** $p < .01$

Splitting the Measures by their Factors or Subscales

Family Resilience Factors. To assess the specific portions of the family resilience scale that demonstrated the most significance in the relationship between family connections and family resilience, these factors were run separately as the dependent variables in the models (see Figure 11 and Table 8). Initially, only the family connectedness subscale ($M = 2.77$, $SD = .42$) was planned, but the analysis was not significant, $R^2 = .05$, $F(8,148) = .94$, $p = .49$. This suggested that the participant's group mean of family connections was not significantly associated with the family connectedness scale.

Subsequent post-hoc analyses were then performed on the remaining factors to understand where family connections significantly impact the family resilience measure. To adjust for multiplicity, Bonferroni's correction reduced the level of significance to $p < .008$. The models with the dependent variable as family communication and problem-solving ($M = 2.81$, $SD = .52$, $R^2 = .16$, $F(8,148) = 3.42$, $p = .001$), utilizing social and economic resources ($M = 2.62$, $SD = .53$, $R^2 = .16$, $F(8,148) = 3.21$, $p = .002$), and family spirituality ($M = 1.94$, $SD = .90$, $R^2 = .15$, $F(8,148) = 2.97$, $p = .004$) were significant. However, while the coefficients for family connections was significant for family communication and problem-solving ($b = .35$, $t(149) = 3.30$, $p = .001$) and utilizing social and economic resources ($b = .42$, $t(149) = 4.15$, $p < .001$), the p value for family spirituality was not significant enough to meet the threshold ($b = .23$, $t(149) = 1.28$, $p = .203$). This means that the frequency of family connections was positively associated with Walsh's factors of family communication and problem solving and utilizing social and economic resources.

Figure 11

Model Derivatives of the Dependent Variable Split into Factors.

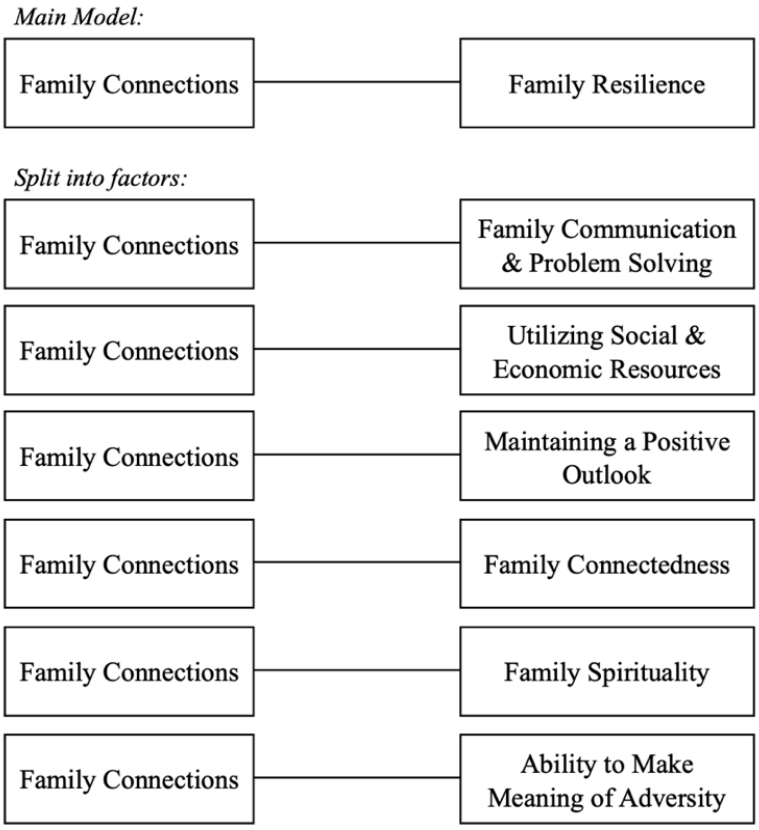


Table 8

Model and Coefficient Statistics for FRAS Subscales.

Dependent Variable	Model			NRI-RQV Coefficient		
	F	*p*	R^2	*b*	*t*	*p*
FCPS Factor	3.42	.001***	.16	.35	3.30	.001***
USER Factor	3.21	.002***	.16	.42	4.15	<.001***
MPO Factor	2.49	.015*	.12	.20	2.00	.047*
FC Factor	.941	.485	.05	.04	.46	.650
FS Factor	2.97	.004***	.15	.23	1.28	.203
AMMA Factor	1.26	.377	.07	.10	.90	.369

Note. FRAS = Family Resilience Assessment Scale, FCPS = Family Communication & Problem Solving, USER = Utilizing Social & Economic Resources, MPO = Maintaining a Positive Outlook, FC = Family Connectedness, FS = Family Spirituality, AMMA = Ability to Make Meaning of Adversity.
* $p < .05$, ** $p < .01$, *** $p < .008$

Family Connections Domains. To understand the valence of behaviours within family connections, analyses were performed regarding the two domains of the NRI-RQV (see Figure 12). The means of the positive domain ($M = 1.98$, $SD = .65$) and the negative domain ($M = 1.19$, $SD = .58$) suggest that participants disclosed more frequent positive connections than negative connections. Instead of the overall family connections score (overall NRI-RQV) as the independent variable, this analysis used these means of the positive and negative domains. The model was significant, $R^2 = .42$, $F(9,148) = 11.33$, $p < .01$ (see Table 9). Both the positive domain, $b = .35$, $t(148) = 7.90$, $p < .01$, and the negative domain, $b = -.15$, $t(148) = -2.86$, $p = .01$, were significant predictors. This meant that more positive connections were associated with increased perceptions of family resilience, as were less negative connections.

Figure 12

Model Derivatives of the Independent Variable Split into Domains and Subscales.

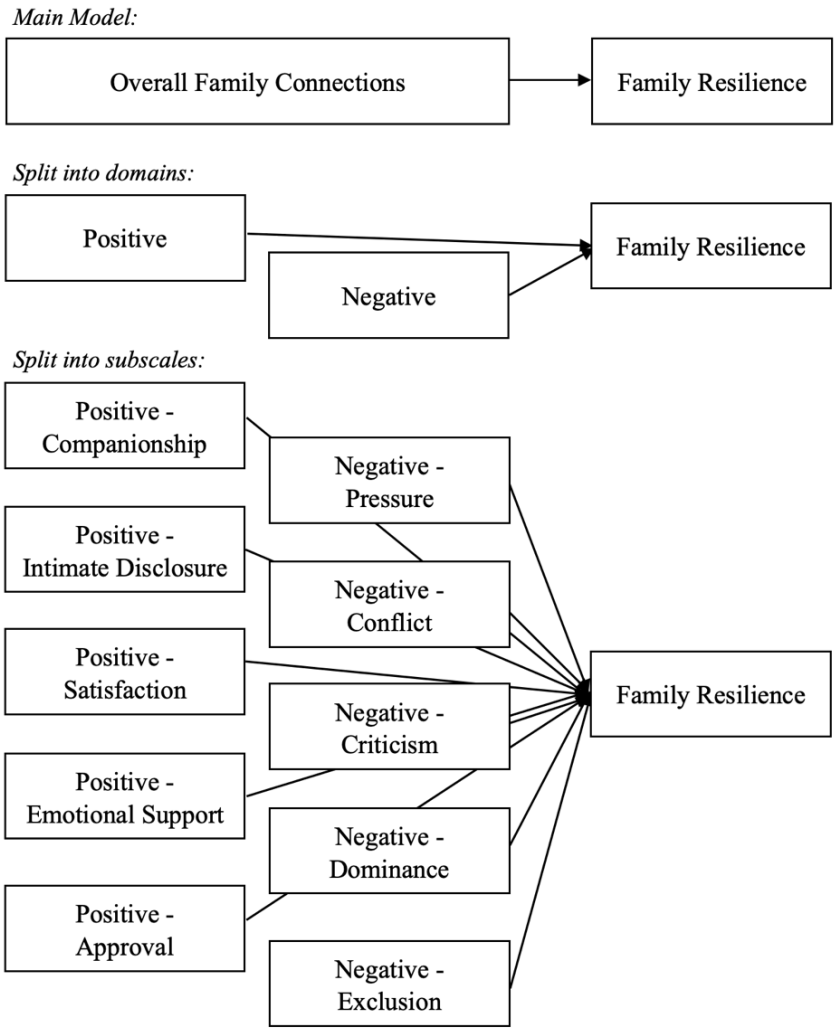


Table 9

Model and Coefficient Statistics for NRI-RQV Domains and Subscales.

Model	Model Statistics			Coefficient	Coefficient Statistics		
	F	*p*	R^2		*b*	*t*	*p*
Domains	11.33	<.01**	.42	Positive	.35	7.90	<.01**
				Negative	-.15	-2.86	.01**
Subscales	7.11	<.01**	0.48	Compassion	.07	1.02	.31
				Intimate Disclosure	.12	1.78	.08
				Satisfaction	.12	2.15	.03*
				Emotional Support	-.01	-.17	.86
				Approval	.05	.78	.44
				Pressure	.01	.17	.86
				Conflict	-.16	-1.96	.05*
				Criticism	.16	1.71	.09
				Dominance	-.09	-1.22	.22
				Exclusion	-.11	-2.04	.04*

Note. * $p < .05$, ** $p < .01$

Family Connections Subscales. The domains could be further dissected into five subscales each of different behaviours or connections with family members. This created ten independent variables in the model (see Figure 12). Within the positive domain, satisfaction had the highest mean frequency of behaviours ($M = 2.60$, $SD = .75$) and intimate disclosure had the lowest ($M = 1.49$, $SD = .77$). Within the negative domain, dominance had the highest mean frequency ($M = 1.38$, $SD = .66$) and criticism had the lowest frequency ($M = 1.08$, $SD = .70$).

The model was significant, $R^2 = .48$, $F(17,148) = 7.11$, $p < .01$ (see Table 9). This suggested that there were significant family resilience predictors when family connections were split into ten subscales. When looking at each factor, satisfaction was the only subscale significant in the positive domain, $b = .12$, $t(148) = 2.15$, $p = .03$. This suggested that of all the positive domains, satisfaction was significantly associated with family resilience. In the negative domain, conflict, $b = -.16$, $t(148) = -1.96$, $p = .05$, and exclusion, $b = -.11$, $t(148) = -2.04$, $p = .04$, were significant. These results suggest that less conflict was associated with more family resilience, as well as less exclusion. The remainder of subscales were not significant.

Exploratory Subgroup Analyses

A total of four different types of subgroup analyses occurred. In these analyses, the subgroups were based on the family members, not the participants. All analyses within this section were still grouped by the participant in OLS regression models with White's adjustment for heteroskedasticity using the participant's "group" mean of connections. Participants who did not have a relative (e.g., they did not have "mother" listed in their family) were excluded from those specific analyses (the stratified subgroup analysis for mothers). Therefore, each analysis had a different sample size. Like all previous analyses performed within this second aim, these analyses contained family size, family structure, and age covariates. As well, since splitting family connections into domains and subscales added rich detail to the nature of significant connections, so subgroup analyses with significant results for the first model containing the overall family connections were further tested at the domain and subscale levels.

Initially, only family member relationship was planned, but further inspection showed that additional subgroups of the family members could be gleaned. It is important to understand that steps were taken to recognize the nature of performing and reporting exploratory subgroup

analyses. Tests for interaction among the subgroup variables were conducted. Additionally, to address the multiplicity since these subgroup analyses had to be stratified (conducted separately), the Bonferroni approach was applied to reduce the chance of finding false positive results.

Family Member Relationship. To understand the impact of specific family members on family resilience, separate analyses were conducted using one member type's connections (e.g., the mean of all member connections who were labelled in the relationship variable as "sibling") as the independent variable instead of the group mean of all member connections. Upon inspection of the data, participants who listed mothers and fathers disclosed only one of these member types within their family, so their analyses contained only one score per relevant participant (e.g., the mean of mother's connections – not the participants' group mean of multiple mothers), allowing for an OLS regression without White's heteroskedasticity adjustment. For siblings and other family members, many participants had more than one of these specific family members, and thus the OLS regression model with White's heteroskedasticity adjustment was still used.

A test for interaction to assess family member relationship on family resilience was significant, $R^2 = .05$, $F(2, 707) = 18.73$, $p < .01$, as was the family member type coefficient, $b = .04$, $t(707) = 3.39$, $p < .01$. This meant that there was an interaction, and I could move forward with subgroup analyses based on family member relationship (see Table 10). To adjust for a high false positive rate within exploratory subgroup analyses containing seven groups, the Bonferroni approach determined that the test of significance was limited to a p level of .007 or less.

Table 10

Coefficient Statistics for Subgroup Analyses of Family Members' Relationships.

Member Relationship	*n*	Model Statistics			NRI-RQV Coefficient Statistics		
		R^2	*F*	*p*	*b*	*t*	*p*
Father	132	0.14	3.39	.004**	0.16	2.17	.032*
Mother	146	0.16	3.64	.001**	0.20	2.87	.005**
Sibling	124	0.18	3.25	.002**	0.18	3.17	.002**
Step-Relative	20	0.29	1.54	.240	-0.02	-0.10	.921
Grandparent	49	0.38	5.28	<.001**	0.10	0.86	.393
Other Adult	27	0.45	6.34	.003**	0.21	1.68	.106
Other Child	18	0.50	2,39	.100	0.09	0.71	.491

Note. * $p < .05$, ** $p < .007$

Father. The model containing overall connections of fathers was significant, $R^2 = .14$, $F(6,131) = 3.39$, $p = .004$, but the coefficient for connections was not significant enough to meet the $p < .007$ threshold, $b = .16$, $t(131) = 2.17$, $p = .03$. This suggested father's connections may not have a significant effect on family resilience.

Mother. The model for mother's overall connections was significant, $R^2 = .16$, $F(7,145) = 3.64$, $p = .001$, and mother's connection was a significant predictor, $b = .20$, $t(145) = 2.87$, $p < .005$. This meant that as mother's connections were stronger, the emerging adult's perception of family resilience was increased. Because of its significance, separate analyses split mother's connections into two domains and ten subscales (found in Appendix L). The model containing the two domains was also significant, $R^2 = .41$, $F(8,145) = 11.97$, $p < .001$. The positive domain was significant, $b = .23$, $t(145) = 6.90$, $p < .001$, but the negative domain was not, $b = -.09$,

$t(145) = -2.31$, $p = .022$. This suggested that of mother's connections, higher frequency of positive connections was significantly associated with higher family resilience. The model split into ten subscales was also significant, $R^2 = .48$, $F(16,145) = 7.51$, $p < .001$. Only the exclusion subscale within the negative domain was significant, $b = -.14$, $t(145) = -3.60$, $p < .001$. In other words, although the positive domain was significant, no specific subscale or behaviour contributed to this significance. For the negative domain, less exclusion from mother was associated with higher family resilience.

Sibling. The model for siblings' overall connections was significant, $R^2 = .18$, $F(8,123) = 3.25$ $p = .002$, as was the connection's coefficient in the model, $b = .18$, $t(123) = 3.17$, $p = .002$. Sibling's connections were a significant predictor of family resilience, suggesting that stronger or more frequent connections with siblings wer associated with increased perceptions of family resilience. When an analysis was run splitting connections into domains (see Appendix L), the model was significant, $R^2 = .20$, $F(9,123) = 3.11$, $p = .002$, but neither the positive domain, b = .13, $t(123) = 2.54$, $p = .013$, nor the negative domain, $b = .03$, $t(123) = .50$, $p = .620$, were significant. This meant that the overall frequency of sibling connections was positively associated with family resilience, but the specific valence of behaviours did not contribute much weight.

Grandparent. For grandparent, the overall connections model was significant, $R^2 = .37$, $F(4,148) = 6.54$, $p < .001$. However, grandparent's connections were not a significant predictor in the model, $b = .10$, $t(48) = .86$, $p = .393$. This meant that although the model was significant, the frequency of connections with grandparents did not significantly affect the participants' perceptions of family resilience.

Step-Relative. The overall model for step-relatives connections was not significant, R^2 = .29, $F(4,19) = 1.54$, $p = .240$, nor was the connections' coefficient, $b = -.02$, $t(19) = -.10$, $p = .921$. This suggested that step-relatives' connections were not significantly associated with participants' perceptions of family resilience.

Other Adult. The model containing other adults' overall family connections was significant, $R^2 = .45$, $F(3,26) = 6.34$, $p = .003$, but the coefficient for connections was not $b = .21$, $t(26) = 1.68$, $p = .106$. This suggested that the frequency of connections with other adults did not significantly affect family resilience.

Other Child. The model for other child members was not significant, $R^2 = .50$, $F(5,17) = 2.39$, $p = .100$, nor was the connection's coefficient, $b = .08$, $t(17) = .71$, $p = .491$. Connections with other children in the family did not significantly impact the emerging adult's perception of family resilience.

Family Member Valence. Family member valence was a qualitative categorization of family members' mean valence. Member valence was computed by subtracting the family members' positive domain average score from the negative domain average score. A score of 1.00 or higher was considered a positive valence, -1.00 or under was a negative valence, and between -1.00 and 1.00 was determined a balanced valence for that particular member. Separate analyses would then be conducted to understand the differences between the subgroups of positive members, negative members, and balanced members.

The test for interaction assess family member valence on family resilience was significant, $R^2 = .10$, $F(2, 722) = 38.53$, $p < .001$, as was the valence coefficient, $b = .19$, $t(722) = 7.78$, $p < .001$. This meant that an interaction existed and subgroup analyses based on family member valence could move forward (see Table 11). To adjust for a high false positive rate

within exploratory subgroup analyses containing three groups, the Bonferroni approach limited the level of significance to $p < .017$.

Table 11

Coefficient Statistics for Subgroup Analyses of Family Members' Valences.

Member Valence	*n*	Model Statistics			NRI-RQV Coefficient Statistics		
		R^2	*F*	*p*	*b*	*t*	*p*
Positive	115	.09	1.35	.226	.05	.62	.536
Negative	34	.29	1.50	.210	.18	.64	.539
Balanced	124	.21	3.87	<.001**	.18	2.46	.015**

Note. * $p < .05$, ** $p < .017$

Positive Members. The model for positive family members was not significant, $R^2 = .09$, $F(8,114) = 1.35$, $p = .226$. The coefficient for connections was also nonsignificant, $b = .05$, $t(114) = .62$, $p = .536$. This suggested that family members who exhibited primarily positive connections towards the participant did not significantly affect family resilience.

Negative Members. The model including only negative family members was not significant, $R^2 = .29$, $F(7,33) = 1.50$, $p = .210$. Again, the coefficient for family connections was not significant, $b = .18$, $t(33) = .63$, $p = 539$. Family members who exhibited primarily negative connections to the participant did not significantly affect family resilience.

Balanced Members. The model for family members who were more balanced in valence was significant, $R^2 = .21$, $F(8,123) = 3.87$, $p < .001$, and the coefficient for family connections was significant, $b = .18$, $t(123) = 2.46$, $p = .016$. Unlike the other two polar groups, the stronger or more frequent connections among balanced family members were significantly associated with increased perceptions of family resilience. A further analysis (more found in Appendix L)

splitting family connections into domains was significant, $R^2 = .24$, $F(9,123) = 63.98$ $p < .001$. However, the coefficients for positive connections, $b = .26$, $t(123) = 2.09$, $p = .039$, and negative connections, $b = -.09$, $t(123) = -.79$, p = .430, were not significant. In other words, more frequent connections with balanced family members were significantly associated with family resilience, but assessing for the specific valence of which behaviours stood out more was not.

Family Member Living Status. Since the questionnaire asked whether the participant lived with the family members they listed, separate analyses were conducted to assess for any differences in members' living statuses. The categorizations included members who lived the entire time with the participant, some of the time, or none of the time.

The test for interaction to assess family member living status on family resilience was significant, $R^2 = .04$, $F(2, 707) = 13.63$, $p < .001$, as was the family member living status coefficient, $b = -.06$, $t(707) = -3.228$, $p = .001$. This significant interaction suggested the stratified subgroup analyses based on family member living status could proceed (see Table 12). The Bonferroni approach for three groups again reduced the level of significance to $p < .017$.

Table 12

Coefficient Statistics for Subgroup Analyses of Family Members' Living Statuses.

Member Living Status	*n*	Model Statistics			NRI-RQV Coefficient Statistics		
		R^2	*F*	*p*	*b*	*t*	*p*
Living the entire time	92	.25	3.37	.002**	.27	2.91	.005**
Living some of the time	69	.22	2.12	.048*	.21	1.78	.081
Never living together	82	.16	2.07	.058	.09	.92	.359

Note. * $p < .05$, ** $p < .017$

Members Living the Entire Time. The model for members who lived with the participant all during the COVID-19 lockdown period was significant, $R^2 = .25$, $F(8,91) = 3.37$, $p = .002$, as was the coefficient for connections, $b = .27$, $t(91) = 2.91$, $p = .005$. This suggested that more frequent connections with these family members were associated with higher family resilience. When overall connections were split into domains (see Appendix L), the model was significant, $R^2 = .48$, $F(9,91) = 8.30$, $p < .001$. The positive domain was significant, $b = .31$, $t(91) = 5.15$, $p < .001$, but the negative domain was not, $b = -.12$, $t(91) = -2.13$, $p = .036$. More positive behaviours from these family members were associated with higher family resilience. To understand further, another analysis split connections into the ten subscales, which resulted in a significant model, $R^2 = .55$, $F(17, 92) = 5.25$, $p < .001$. However, there were no significant subscale coefficients, suggesting that no particular behaviour was associated with increased family resilience.

Members Living Some of the Time. The model for members that the participant lived with sometimes was not significant, $R^2 = .22$, $F(8,68) = 2.12$ $p = .048$. The coefficient for connections was also not significant, $b = .21$, $t(68) = 1.78$, $p = .081$. This meant that the frequency of connections among these members was not significantly associated with family resilience.

Members Living None of the Time. The model with the participants' family members who never lived with them during COVID-19 was not significant, $R^2 = .16$, $F(7,81) = 2.07$, $p = .058$, nor was the coefficient for connections, $b = .09$, $t(81) = .92$, $p = .359$. This suggested that connections with family members whom participants did not live with did not significantly affect family resilience.

Family Member Gender. Lastly, due to the genders implied within relationship types, family members could be categorized into male, female, or unknown. Male members included

father, brother, grandfather, step-relatives listed as step-father or step-brother, uncle, nephew, boyfriend, or neighbour (father figure). Female members included mother, sister, grandmother, a step-relative listed as step-mother or step-sister, aunt, niece, godmother, or neighbour (mother figure). Unknown gender members included sibling, cousin, or members that were unlabeled.

The test for interaction to assess family member living status on family resilience was significant, $R^2 = .02$, $F(2, 722) = 8.33$, $p < .001$, but the family member gender coefficient was not, $b = -.03$, $t(722) = -1.16$, $p = .245$. This suggested no interaction between this subgroup variable and the dependent variable, which resulted in no subsequent subgroup analyses.

Qualitative Item Analysis

A total of 46 participants filled out the qualitative item; however, six only typed "N/A." Therefore, item analysis was performed on $n = 40$ responses. Initial review of the data showed that responses were not overly comprehensive, so continuing with the planned thematic analysis would be difficult to attain. Following Saldaña (2016), items were simply coded and then categorized into valence and content.

Valence in this context referred to whether the responses contained a positive, negative, or neutral tone. The data found ten responses that were solely positive, nine that were solely negative, six that were solely neutral, one that was a mix of positive and neutral comments, three that were a mix of negative and neutral tones, and eleven that offered both negative and positive tones. A resulting interpretation suggests there was a balanced view of opinions provided, wherein participants who chose to respond to this final item were not mostly negative or mostly positive.

The content of the responses fell into eight different subcategories. Some of the lengthy or descriptive responses applied to two or more subcategories and so were double-coded. The

eight subcategories included family dynamics, family structure changes, feelings towards family, COVID-19 impacts on family, COVID-19 impacts on individuals, COVID-19 impacts in general, clarifying survey responses, and survey reflection. Family dynamics (n = 13) included situational aspects of how the family operated, including divorce, a certain member having a disorder or disability, certain relationships being better than others, or the living situation of the overall family. Family structure changes (n = 5) primarily indicated when a member (the majority being the participant themselves) left the family home during the pandemic. Feelings about the family (n = 11) disclosed more qualitative responses from the participant, and for the most part, were generally positive (e.g., "I feel I have a really nice family") or motivational (e.g., "[I] am working to 'break the intergenerational curse'"). There were n = 18 responses related to COVID-19's impacts on the family, such as how hard it was to visit members, how it brought their family closer together, how it impacted finances or how it adjusted the topic of arguments. COVID-19 impacts on the self (n = 6) were primarily mental health-related, which were generally negative. COVID-19 impacts in general (n = 5) was when the participant used descriptive words about this time, such as "new experience" or "difficult." The last two content types handled survey responses, where clarifying responses (n = 7) were about errors about family members (which were adjusted appropriately) or how the survey was difficult to answer because of one specific family member, and survey reflection (n = 4) was when participants disclosed how the survey was very comprehensive or that it brought back memories of the COVID-19 lockdown period and how they were with their family at that time.

Discussion

This study was designed to shed more light on the construct of family resilience within the context of COVID-19 and in consideration of connections. While results may not have occurred as expected, both aims provided good directions of future research.

The First Aim: Cautions in Theoretical Designs

The first aim was terminated due to conceptual issues that were quantitatively determined during statistical model development. The moderator scale, family resilience, and the outcome scale, family satisfaction, demonstrated a high positive correlation. This correlation speaks to the struggle during the study construction for choosing a suitable dependent variable. When family resilience is placed as a process (or predictor variable) within a model, finding a good outcome variable has been an ongoing challenge (Maurović et al., 2020). Many scales related to family functioning, bon-adaptation, or even family satisfaction (e.g., Family Assessment Measure III, Skinner, Steinhauer & Sitarenios, 2000; Family Environment Scale 3rd edition, Moos & Moos, 1994; Family Adaptability and Cohesion Evaluation Scale IV, Olson & Gorall, 2006) resembled the FRAS on many aspects. The QoL was chosen due to its face value being different from the FRAS and prior evidence of a high correlation between family satisfaction and family functioning (Bandura et al., 2011; Szcześniak & Tułecka, 2020). In the end, the high correlation between these two measures suggests that they may be measuring similar constructs. However, I failed to recognize that placing family resilience as a predictor variable might be the more concerning issue.

Positing that family resilience can exist simultaneously in a model as a process and outcome might have been the fundamental problem. My predetermined definition of family resilience as a process composed of a risk, mechanisms, and a good outcome highlights that the

outcome is predetermined, wherein there are no other options in the model. This definition fails to describe what happens when one family's mechanisms are operating but the final outcome is in a worse-off position, or if another family shows no change in response to a risk but the final result is still favourable. Which of the two families is resilient? When a predictor requires the outcome to be positive, it is no longer a predictor.

There were three other options that I could have taken that would have resulted in a more conceptually sound model. One was to continue to use family resilience as a predictor variable (and possibly a moderator or mediator, depending on the model) on an outcome variable that was not directly related to family resilience. Other literature on family resilience has often used mental health outcomes like depression, anxiety, or stress (Chan et al., 2021; He et al., 2021; Wei et al., 2023) or another family member's resilience (Finklestein et al., 2020). The second option could have been to consider family resilience as the outcome variable. Bates and colleagues (2021) use this method and describe how family routines buffered the effect of COVID-19-related stress on family resilience. This option considers resilience a final outcome rather than a process. The final option is to remove resilience as a direct study variable and instead conceptualize a model of family resilience comprised of constructs or key processes. A previously mentioned example includes the Eales and colleagues' study (2021) that assessed family resilience without directly having it in the model.

The third option is the design that Wong and colleagues (2022) used in their recent study. Their model consists of COVID-19 stressors as the independent variable, family functioning as the dependent variable, and three family constructs within the model of which they were trying to assess were moderators or mediators. The three constructs were couple relationship, parent-child conflict, and utilization of community resources, with this final construct assessed using the

USER subscale of the FRAS. Their results found that couple relationships mediated and moderated stressors' impact on family functioning, and the other two constructs had neither effect. Family resilience was not listed as a construct within the model but was considered from the overall ecological perspective (Wong et al., 2022).

This approach makes conceptual sense if we continue to conceptualize resilience to include a risk or stressor on a system *and* a system adaptation *and* a positive outcome such as continued or improved functioning. Like a scale with multiple subscales, a single quantitative indicator of resilience obscures several essential processes and outcomes within it that make it a measurement nightmare and therefore better described by its component parts, if indeed all of them are necessary for the construct to be in-place.

Therefore, this study could not continue with the first aim hypotheses and thus found no tangible results for considering family resilience moderating the effect of COVID-19 challenges on family satisfaction. Further attention was needed to use these measures appropriately for the conceptual model of family resilience.

The Second Aim: Exploration between Connectedness and Resilience in Families

To understand the association that individual connections have on family resilience, the abundant data from the NRI-RQV was used in our second aim. Here, connections referred to the frequency of behaviours one family member exhibited towards the participant. This one-sided perspective aligns with the FRAS measure that assesses family resilience from only a single member. Since no study has looked at the structural dynamic of family systems on their resilience, notably the strength of connections among family members, this aim sought to identify hypotheses that could generate future research questions.

The numerous results of this second aim can be summarized into two components. The first dissects the participants' average connections within the family. The second component hones on individual family members within families, which were considered exploratory subgroup analyses.

Overall Connections on Resilience

The primary analysis indicated that family connections were significantly associated with family resilience, wherein family resilience increased as the frequency of connections with family members increased. This revealed that the frequency of connections does not match the internal rigidity of CAS connectedness because CAS connectedness and resilience have a negative association in the adaptive cycle (Holling & Gunderson, 2002). However, it is consistent with frameworks that consider connectedness as a mechanism within family resilience. This does raise the question of whether family connections are a construct within resilience or a distinct but interrelated concept like connectedness.

Family size was a significant predictor, which suggested that more family members were associated with higher perceptions of family resilience. This finding could be related to more accessible supports; rather than relying on only one or two parents, there are multiple individuals to provide support, collaborate, and problem-solve together. Additional members may create a summative effect that increases levels of family resilience. Additionally, the variance of family connections was not a significant predictor. This suggests that future studies are better to focus on the overall average of connections among family members, rather than whether all family members have the exact same score. The model was then forgiving to family structures where some members rarely connected with the participant or were overly connected to the participant compared to the rest of the family. It may be related to the living status of every member too.

Thus, while living situation appeared to be a concern for research regarding emerging adults and members of their families of origin (whether they or other members are living away from the rest of the family), it may not play a significant role in the emerging adult's overall perception of whole-family dynamics like resilience. Family resilience could be measured independently of living status.

Analyses also tried to unpack how connections affect resilience by looking at the factors of the resilience scale. I expected the family connectedness factor within Walsh's resilience framework to be the most impacted by family connections. The results for this factor were not significant, perhaps due to issues regarding the subscale construction; this factor was made up of six items (out of the total 54 in the scale, much less than one-sixth of the entire scale), and four of the six items were the only reverse-scoring items in the full scale. It also might be explained by the nuanced differences between family connectedness and family connections. Walsh's process of family connectedness focuses on mutual support and commitment to each other (Walsh, 2003) rather than on the frequency of behaviours. Family connections described as a frequency of behaviours could be a distinct construct of family resilience. The significant subscale models included family communication & problem solving and utilizing social & economic resources, which suggest something about the frequency of connections that impact these areas of Walsh's family resilience framework. These are the largest subscales within the FRAS, comprising 27 and 8 items, respectively. Communication and problem-solving require much interaction among family members, which might contribute to the significant association. The utilizing social and economic resources subscale is a surprise, as items do not directly relate to the frequency of interactions.

Domains and subscales provided more richness to describe what type of family connections are associated with family resilience. When splitting the measure into domains, results showed that more positive and fewer negative connections were associated with higher family resilience. When splitting the measure into subscales, results showed more satisfaction, fewer conflict, and fewer exclusion behaviours were significantly associated with more family resilience. This satisfaction behaviour coincides with the high positive correlation found between the family satisfaction and family resilience scales. Exclusion is known to be a type of social aggression more common in females (Benenson et al., 2013), so less satisfaction can help increase the participant's view of family resilience.

Subgroup Connections on Resilience

Since valuable information regarding family connections was gathered at the dyadic level, I could assess whether particular family members contribute more to family resilience than others. Subgroup analyses expanded post-hoc, understanding that family members could be differentiated by relationship, valence, and living situation. With these analyses being exploratory, I restricted any comparative interpretations due to variations of statistical power and small cell samples across the multiple subgroup analyses. Rather, this section focuses on significant results only, with the understanding that there may have been an inflated rate of false positive results from the nature of exploratory analyses and the multiple analyses conducted.

When splitting analyses by specific family member relationship or type, results indicated certain family members significantly affected family resilience across participants. The overall models for mother and sibling were significant. This finding supports the rationale for research on mother-child (e.g., la Valley & Guerrero, 2012) and sibling (e.g., Ferriby, 2015) bonds. This likely could be attributed to the higher proportion of these member types within the sample size.

When diving further into the specific types of behaviours (the subscales), significant differences were only found for mothers' increases in positive behaviours and decreases in exclusion behaviours. These findings are very similar to the findings of the domain and subscale models in the overall connections analyses, and mothers' connections likely bore significant weight within those results.

Next, post-hoc analyses split family members by types of valences (e.g., the participant deemed certain members more positive, negative, or balanced). Members who were deemed more polar, either positive or negative, did not significantly affect the participant's perception family resilience, but those who were more balanced, exhibiting both positive and negative behaviours, did impact family resilience. Although in the previous analyses above (more overall positive behaviours and less overall negative behaviours were associated with family resilience), these findings do not support a family structure of only positive connections. One qualitative response in the study reflects a desire for both positive and negative attitudes in the family: "I have a great family balance, just they think critically of me (for the better)." Perhaps some negative behaviours contribute to helping a family stick together, helping individuals understand and regulate various emotions, and ultimately helping individuals adapt and cope when faced with negative experiences.

When splitting analyses by specific family members based on their living situation, emerging adults who lived with family members the entire time of COVID-19 lockdowns provided the most valuable information. If the overall frequency of connections was positively associated with family resilience, it makes sense that members living the entire time with the participant had a higher opportunity to interact and connect with the participant than other members. Also, consider the previous subgroup analyses that were significant for mothers and

siblings, who were more often living in the home with the participant (ranging from 42-55% of all participants) than the other member types (47-96.2%). It suggests that family resilience was affected strongest by individuals that participants see daily. Certain members that the emerging adult lived with on a regular basis shaped their current conception of family resilience, but overall current living status of the participant did not play as big a role.

Strengths and Implications

This is one of the first studies to consider family resilience in young adults that allows for several different categorical family structures. These results emphasize that family structure and size are necessary factors to consider. Findings showed a significant correlation between family structure and many study variables. Limiting the definition of a family, as most research does to mother, father, and child, only dismisses other family system structures that many individuals grow up within (in our case, 50% of the data). Further comparisons can be done to understand the intricacies of these differences among family structures.

It is important to note that results are provided from the perspective of one individual agent within the family. While this does not reflect a proper, comprehensive, and unbiased understanding of the family system and its level of resilience, this offers a number of suggestions for how young adults perceive their family of origin and the dynamics of their family system. Other research studies tend to focus on the parents, not the child (Eales et al., 2021; Wong et al., 2022). Interestingly, Finklestein and colleagues (2020) found that perceptions of family resilience from one family member can impact the other. Specifically, how an adolescent family member perceived family resilience moderated the relationship between the parent's perception of family resilience and the adolescent's perception of individual resilience (Finklestein et al., 2020). Therefore, even though this study does not use family-level data, it is interesting to get the

perspective of at least one individual. Future studies can look into whole-level family resilience or compare the opinions of multiple individuals.

The time period for this study is noteworthy. This period of COVID-19 lockdowns is a historical point in this lifetime that helps to provide context and understanding of what families went through. This research also taps into the subjective experience of emerging adults in Ontario, Canada, at this time. Admittedly, much of the COVID-19 data gathered was retrospective; however, it secures a perspective at a particular time point regarding how emerging adults felt about the pandemic and their families. Additionally, the COVID-19 data did not make it into the analyses, but it was at least collected for future analyses.

It is a shame that the data for the first aim could not be assessed as initially planned. It speaks to creating a sound conceptual model at the research literature review and design construction stages. This thesis project can be a good lesson to other early researchers about the importance of a strong design at the forefront so that the study has clear results.

Limitations

The data did its best to gather a full understanding of the participants' family structure, but it was not comprehensive. Although participants disclosed all their current family members, they may have left out their estranged or deceased members. Without this information, or the context in which those disconnections from the family occurred, this affects the family structure variable and the dynamics inherent to each family. Additionally, while we did receive information as to whether they were living with certain family members, we did not ask whether certain members (e.g., siblings or other children such as cousins or nephews) were older or younger, possibly changing the dynamic of the family structure. The investigators constructed the family structure variable, so the participant did not disclose it. While the participant discloses

each dyad they are involved in within their family of origin, the perspective of the other member in the dyad was not collected. This study also ignores dyads the participant is not involved in (e.g., their father and mother's relationship), limiting the understanding of family resilience to the participant's perspective rather than an overall comprehensive understanding of the family system.

The NRI-RQV was a particularly challenging portion of this study. Participants struggled to follow instructions when listing their family members (many included themselves). A number of participants had to be excluded from this study because they did not finish this portion of the survey, or their response patterns indicated they were running through this portion without answering honestly.

While we looked at family resilience as an ongoing process, there needed to be more understanding of the base level of family resilience before the pandemic or during the lockdown period. COVID-19 impacts directly asked about family dynamics between March 2020 to March 2022 (retrospective), whereas family resilience and family satisfaction was about family dynamics between April 2022 to April 2023 (concurrent). Retrospective data is known for decreased reliability and threats to internal and external validity (Tofthagen, 2012), so recollecting two different time periods at the same time may have been too confounding for the participant to respond accurately. Since interpretations and conclusions about one's family can fluctuate, participants may have provided their current interpretation rather than their interpretation immediately after these stressors at the end of March 2022. This also limited the longitudinal understanding of where each family system was within the adaptive renewal cycle. It would have been better to perform longitudinal studies to understand family resilience (De

Haan et al., 2002), as the study would track the varying levels of resilience, potential (family satisfaction), and connectedness over time.

Lastly, the convenience sample from a university in Thunder Bay limits the generalizability of the results. Individuals from university samples likely come from middle- to higher-income families, yet lower-income families were more at risk of COVID-19 challenges (Bates et al., 2021; Prime et al., 2020). Our sample was reasonably balanced in terms of annual household income, if not more on the lower end, but this item was directly asking about the participant's household income in their current living status. Participants who may not live with their family could have only included themselves in that variable, so this was not a good indicator of income status. Additionally, we did not ask about international or domestic student status, which may have affected psychological isolation and solitude compared to other students whose families were within driving distance.

Future Directions

This study was a reasonable effort to further unpack family resilience in the context of emerging adults, but this area of research still needs more work. The first aim required analyses to be rerun with a sound conceptual model, and the second aim provided hypotheses for which to test. With the present data, we found that family connections were associated with family resilience. Other studies have used FCPS and USER subscales of the FRAS separately as predictor variables rather than an entire family resilience construct acting as a predictor variable. With this in mind, I propose that third option of a model for assessing family resilience, considering it as the overarching perspective or model wherein the independent variables would continue to be family stressors and family impacts of COVID-19, and the dependent variable would be family satisfaction. The possible moderators include average family connections,

family communication and problem-solving, and utilizing social resources. This would mimic the study that Wong and colleagues (2022) developed but with slightly different variables and a different population and culture. This then treats family resilience as a working model of an ongoing and dynamic process rather than an outcome.

Other directions include family-level data collection rather than individual-level. Our study has collected the perspective of the emerging adult. However, it would be interesting to assess how the parents felt during this time period and the series of adjustments, similar to that of Finkelstein and colleagues (2020) who assessed two family members' level of resilience. For family systems' connections, it would be beneficial to gain a more unbiased view of the whole family by collecting the same information from multiple family members and developing a network analysis of the family system regarding the frequency of behaviours. Alternatively, measuring family-level variables is optimal through family-level data collection methods.

Ideally, it would be good to perform this study multiple times around the next future event (before, during, and following the event) to collect data along all stages of the adaptive renewal cycle and map out how the levels of family satisfaction, resilience, and perceptions of the stressor change over time. For the advancement in resilience research, I would expect that results from these studies would accentuate family resilience as a fluctuating property of a system rather than an end goal, as most family resilience research tends to consider.

For emerging adults, this research was very informative in understanding both the cohesion of their family and the differentiation from their family. It would be interesting for future studies to include other significant relationships in emerging adults' lives to see how it compares to how they feel about their family of origin.

Conclusion

This study kickstarts more research on family resilience for young adults. The first aim necessitates a good conceptual model to rerun the analyses to understand the full impact of COVID-19 on family satisfaction. The second aim opens the door for many studies to assess the association between family connections on family resilience. A future study could combine the two aims together. Results showed that the structural make-up of the frequency of individual connections does impact family resilience, which can be unpacked via the types of behaviours and the particular family members. This study was a good step in understanding family systems at this developmental stage and their perceptions of how these individuals view their family of origin.

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Appendix A

Recruitment Poster

Participants Needed!

FAMILY OF ORIGIN IN THIS CURRENT STATE OF COVID-19

PURPOSE:
To investigate the relationships between COVID-19 changes, family resilience, family satisfaction, and the role of individual connections among family members

ELIGIBILITY CRITERIA:

- Ages 18-29
- Ability to read English
- Live in Thunder Bay region since March 2020
- Have contact with at least one member of their family of origin

PROCEDURE:

Participation will involve anonymously filling out a series of questionnaires on SurveyMonkey (takes 30-60 minutes).

Participants will receive 2 bonus points towards eligible Lakehead University courses (where permitted by the course instructor), or be entered in a chance to win a $30.00 SkipTheDishes gift card!

WHO IS MY FAMILY OF ORIGIN?
Those who raised you and who you were with during childhood. Members do not have to live in the same household or have been present the entire time

TO SIGN UP:
Scan the QR code or contact mklassen@lakeheadu.ca for more details!

Appendix B

Recruitment on SONA Management System

Study Name:

Family of Origin in this Current State of COVID-19

Detailed Description:

This study aims to investigate the relationships between COVID-19 changes in the family, family resilience, family satisfaction, and the role of individual connections among family members within your family of origin.

Who is your family of origin? It includes those who raised you and who you were with during childhood. Members do not have to live in the same household or have been present the entire time.

Participation will involve anonymously filling out a series of questionnaires on SurveyMonkey (takes 20-60 minutes). After, you will receive 1 bonus point toward eligible Lakehead University courses and be entered into a chance to win a $30.00 SkipTheDishes gift card!

Eligibility Requirements:

Ages 18-29, resides in Thunder Bay region since March 2020, ability to read English, have contact with at least one member from their family of origin (who they grew up with)

Appendix C

Study Information and Consent Form

Lakehead UNIVERSITY | Department of Psychology

Families of Origin in this Current State of COVID-19

Introduction

Dear Potential Participant,

You are invited to participate in a research project entitled "Families of Origin in this Current State of COVID-19," conducted online for the Complexity, Culture, and Resilience Lab at Lakehead University. In this study, we are interested in assessing the perceptions of Canadian young adults' experiences with their families amidst the ongoing COVID-19 pandemic. Specifically, we would like to see how people perceive their relationships with their family members and their level of family resilience, and how this may impact the relationship between COVID-19 stressors and family satisfaction.

PURPOSE OF THE STUDY
It is our intention to publish the results from this research in a peer-reviewed scientific journal and to share our findings at a scientific conference. This will allow us to circulate our research throughout the scientific community and the general population.

NATURE AND DURATION OF PARTICIPATION
As a participant in this study, you will be asked to complete an online survey regarding a series of categories. First you will be asked about demographic information (e.g., age, gender). Next you will be asked to identify and describe your relationship with at least one member of your family of origin, which refers to the persons who raised you and whom you spent the most time with during childhood. Finally, we will ask a series of questions regarding your perceptions of your relationship with your family members, family resilience, lifestyle changes in relation to COVID-19, and family satisfaction. Your participation is completely voluntary, and you may choose to decline to answer any question. This survey will take between 20 to 60 minutes to complete.

BENEFITS ARISING FROM YOUR PARTICIPATION
This is a pure, basic research study, and so there are no immediate individual benefits to participating in this study. However, being a participant, you will learn about the research process as well as what helps develop family resilience, reflecting on strengths within your family. All participants who complete this study will have the chance to be entered into a draw to win a $30.00 SkipTheDishes gift card. Additionally, SONA registered participants who are in courses that offer bonus marks will be given 1 bonus point toward eligible Lakehead University

courses (where permitted by the course instructor). If you would also like to receive a summary of the results at the end of this study, you may contact one of the researchers.

RISKS ASSOCIATED WITH YOUR PARTICIPATION

There is no risk of physical harm as a consequence of participating in this study. However, reflecting on your feelings with certain family members as well as the impact of the COVID-19 pandemic on your personal and family life may cause you some distress. If you are distressed during or after your participation in this study, please contact the Student Health and Wellness Centre at Lakehead University at 1-807-343-8361 or other appropriate support. Some helpful resources about COVID-19 and mental health services are provided below and at the end of the survey.

WITHDRAWAL FROM THE STUDY

It is important to understand that your participation in this research study is completely voluntary. You have the right to decline to respond to any question you choose not to answer, and you may withdraw from the study at any time up until you click "Submit Responses" at the end of the survey. At that point your data is anonymous, and we are unable to distinguish your responses from those of other participants.

CONFIDENTIALITY & ANONYMITY

No identifying information will be asked of you (e.g., name), and your responses will be anonymous. If you would like to be entered into the gift card draw, you will be asked to provide an e-mail address on a separate survey so that we may contact you should you win. This e-mail address will not be tied to your survey responses.

Please note that the online survey tool used in the study, SurveyMonkey, is hosted by a server located in the USA. The US Patriot Act permits U.S. law enforcement officials, for the purpose of anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without the person's knowledge. In view of this, we cannot absolutely guarantee the full confidentiality and anonymity of your data.

Once the data collection is complete, this data will be removed from SurveyMonkey. The developers of the survey that specifically ask about COVID-19 stressors and impacts will be given a copy of the raw item-level responses (the responses to each question) but will not be given any identifiable data. The full data will be stored on a computer in Dr. Stroink's research lab for a minimum period of five years in accordance with Lakehead University's policy on data storage.

COMPENSATION/COMPENSATORY INDEMNITY

This research study does not provide any compensation towards participation. Participation in the study is entirely voluntary. While you will not be reimbursed for any participation-related expenses or provided compensation for injury, you have not waived any rights to legal recourse in the event of research-related harm or injury.

RESEARCH ETHICS APPROVAL

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to

speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8283 or research@lakeheadu.ca.

LIABILITY CLAUSE
By agreeing to participate in this study, you do not give up any of your legal right, nor release the researchers, the institutions or any other involved party of their legal and professional obligations.

Your voluntary participation is greatly appreciated. If you have any questions or would like to receive a summary of the results of the study, please contact the researchers using the information below.

Thank you,

Mirella Stroink, Ph.D. Psychology
Dean of the Faculty of Health and Behavioural Sciences, Associate Professor
Department of Psychology, Lakehead University
Email: mstroink@lakeheadu.ca

Mikayla Franczak, HBSc
MA Clinical Psychology candidate
Department of Psychology, Lakehead University
Email: mklassen@lakeheadu.ca

Resources regarding the COVID-19 pandemic:

- World Health Organization: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public
- Government of Canada: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html

Resources regarding the COVID-19 pandemic and mental health support:

- World Psychiatric Association: https://www.wpanet.org/covid-19-resources
- Mental Health Commission of Canada: https://www.mentalhealthcommission.ca/English/covid19
- Guide to living with worry and anxiety amidst global uncertainty (several languages): https://www.psychologytools.com/articles/free-guide-to-living-with-worry-and-anxiety-amidst-global-uncertainty/
- Helping children cope with changes resulting from COVID-19, a resource for parents from the National Association of School Psychologists (USA and beyond): https://www.nasponline.org/resources-and-publications/resources-and-podcasts/school-climate-safety-and-crisis/health-crisis-resources/helping-children-cope-with-changes-resulting-from-covid-19
- The Centre for Addiction and Mental Health (Canada): https://www.camh.ca/en/health-info/mental-health-and-covid-19
- Government Ontario Mental health, wellness, and addictions support: https://www.ontario.ca/page/covid-19-support-people#section-4

Resources regarding mental health support:

- Wellness Together: Text WELLNESS to 741741 for immediate support
- ConnexOntario: Call 1-866-531-2600
- Talk4Healing: Call or Text 1-855-554-HEAL, or use live chat on their website
- Good2Talk: Call 1-866-925-5454 or Text "GOOD2TALKON" to 686868
- Youthline: Text (647) 694-4275, or use live chat on their website
- Local Resources (Thunder Bay, Ontario)
- Thunder Bay Counselling: Call (807) 684-1880 or visit https://www.tbaycounselling.com/
- Dilico Anishinabek Family Care Mental Health Services: Call (807) 624-5818 or visit https://www.dilico.com/mental-health-addictions/
- North of Superior Programs: Call 1-877-895-6677 or visit https://www.nosp.on.ca/
- Lakehead University Student Health & Wellness: Call (807) 343-8361 or visit https://www.lakeheadu.ca/students/wellness-recreation/student-health-and-wellness

Consent

By clicking "next" below at the bottom of this form, I am indicating that:

1. I have read the information contained in the introduction letter. I understand the nature of this study and what is being investigated.
2. I agree to participate in the "Families of Origin in this Current State of COVID-19" study.
3. I understand the potential risks and benefits of the study.
4. I recognize that I am a volunteer and may choose not to answer any questions. I can withdraw from the study up until I click "submit responses" at the end of the survey.
5. I understand that my responses will be kept anonymous and will be securely stored at Lakehead University Psychology Department for a minimum period of 5 years. Data will be accessible only by the research investigators and will be combined in any presentation or publication so no individual responses will be identifiable.
6. I understand that the online survey tool used in the study, SurveyMonkey, is hosted by a server located in the USA. The US Patriot Act permits U.S. law enforcement officials, for the purpose of anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without the person's knowledge. In view of this, we cannot absolutely guarantee the full confidentiality and anonymity of your data. With your consent to participate in this study, you acknowledge this.
7. I understand that your participation will remain anonymous in any publication or public presentation of the research findings.
8. I understand that if I have any questions during or after my participation, I may contact Dr. Mirella Stroink or Mikayla Franczak through email.
9. I have not waived any rights to legal recourse in the event of research-related harm.

By clicking "next," I am indicating that I understand the premise and requirements of the study and that I am consenting to participate in the study.

Appendix D

Debriefing Form

Concluding Remarks

Dear Participant,

Thank you for participating in the "Families of Origin in this Current State of COVID-19" Study. If you would like a summary of the research findings after the data has been analyzed, or if you have any questions or concerns about the present study, please feel free to contact the researchers using the contact information below.
If you would like to be entered into the raffle to win a $30.00CDN SkipTheDishes gift card, please click on the following link [https://www.surveymonkey.com/r/BQ739D3]. Here you will be asked to provide an e-mail address that we can use to contact you should you win.
If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or research@lakeheadu.ca.
If completing this study has raised any issues about mental health concerns that you would like to discuss, we have provided some resources below relating to the COVID-19 pandemic and mental health. We also provide more information on the subject of this research below.
We thank you for your time and participation – it is greatly appreciated.

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Dean of the Faculty of Health and Behavioural Sciences and Associate Professor
Department of Psychology, Lakehead University
Email: mstroink@lakeheadu.ca

Mikayla Franczak, HBSc
MA Clinical Psychology candidate
Department of Psychology, Lakehead University
Email: mklassen@lakeheadu.ca

Resources regarding the COVID-19 pandemic:

- World Health Organization: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public
- Government of Canada: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html

Resources regarding the COVID-19 pandemic and mental health support:

- World Psychiatric Association: https://www.wpanet.org/covid-19-resources
- Mental Health Commission of Canada: https://www.mentalhealthcommission.ca/English/covid19
- Guide to living with worry and anxiety amidst global uncertainty (several languages): https://www.psychologytools.com/articles/free-guide-to-living-with-worry-and-anxiety-amidst-global-uncertainty/

- Helping children cope with changes resulting from COVID-19, a resource for parents from the National Association of School Psychologists (USA and beyond): https://www.nasponline.org/resources-and-publications/resources-and-podcasts/school-climate-safety-and-crisis/health-crisis-resources/helping-children-cope-with-changes-resulting-from-covid-19
- The Centre for Addiction and Mental Health (Canada): https://www.camh.ca/en/health-info/mental-health-and-covid-19
- Government Ontario Mental health, wellness, and addictions support: https://www.ontario.ca/page/covid-19-support-people#section-4

Resources regarding mental health support:

- Wellness Together: Text WELLNESS to 741741 for immediate support
- ConnexOntario: Call 1-866-531-2600
- Talk4Healing: Call or Text 1-855-554-HEAL, or use live chat on their website
- Good2Talk: Call 1-866-925-5454 or Text "GOOD2TALKON" to 686868
- Youthline: Text (647) 694-4275, or use live chat on their website
- Local Resources (Thunder Bay, Ontario)
- Thunder Bay Counselling: Call (807) 684-1880 or visit https://www.tbaycounselling.com/
- Dilico Anishinabek Family Care Mental Health Services: Call (807) 624-5818 or visit https://www.dilico.com/mental-health-addictions/
- North of Superior Programs: Call 1-877-895-6677 or visit https://www.nosp.on.ca/
- Lakehead University Student Health & Wellness: Call (807) 343-8361

Description of the study subject:

This research will help us gain an understanding of the effect of family resilience and individual connections among family members in the relationship between COVID-19 impacts and family satisfaction. Specifically, your answers will help us understand how various family structures have fared during the pandemic and whether there are significant findings within resilience or connectedness that contribute to family satisfaction.

If we picture a family like a system, it is made up of agents (family members), connections (relationships, communication, etc.), and functions. Families resemble a complex adaptive system, wherein there are complex behaviours and patterns in the system, and it can evolve and grow over time despite many challenges. Within a system exists resilience, or the ability of a system to persist or adapt despite the facing stressors (Holling, 1973). Family resilience exists in its own body of research as a process of the system that helps the family manage through stressors and offer the potential for transformation and growth (Walsh, 2003). Studies on family resilience have found a number of emerging themes or protective factors that help to build resilience. One of the factors that strengthen family resilience is connectedness.

The purpose of the study is to examine the family systems process of resilience, and the role of individual connections, on family satisfaction in the context of the changes and traumas caused by COVID-19. We want to look at the young adult's perspective of family resilience and connections within the family of origin and how COVID-19 stressors and impacts are associated with their family satisfaction. This study has two separate aims. The first aim is to examine the relationship between COVID-19 impacts and family satisfaction, with family resilience as a moderator. We first hypothesize a negative correlation between the number of stressors and the level of family satisfaction. When family resilience is added to the model, it will moderate these

stressors' effect on family satisfaction, such that COVID-19 stressors will be negatively associated with family satisfaction only when family resilience is low. When family resilience is high, COVID-19 stressors will not be significantly associated with family satisfaction. The second aim of the study is to examine the role of family connections in family resilience. While there is research on overall family connectedness on family resilience, no existing study has focused on the role of the quality and strength of dyads on family resilience. We can presume that all positive and strong connections lead to high family resilience, but no study focuses on what happens if there is one dissimilar connection or whether high family resilience can be attained with all strong but negative connections. Therefore, this is a more exploratory aim to understand what family resilience is and how it adapts.

Appendix E

Demographics Questionnaire

Note. In the "Families of Origin" section, this appendix shows the questionnaire how it would display for 10 or more members. Page logic has been applied to the survey such that the response to item #8 leads to a different page, depending on the number of members. The redundant pages "Families of Origin – 1 member" through "Families of Origin – 9 members" have been omitted.

Demographics

Please indicate your demographic information below. These demographic questions will remain confidential and will not be used to identify you as a participant.

1. What is your current age (in years)?

_____

2. What is your gender identity? Please select all that may apply.

- ☐ Male
- ☐ Female
- ☐ Transgender
- ☐ Non-binary
- ☐ Prefer not to say
- ☐ Something else (please specify): _____

3. How do you describe your racial, ethnic and/or cultural background? Please check all that apply.

- ☐ Indigenous (e.g. First Nations, Métis, Inuit, or other descent)
- ☐ Latinx (e.g., Latin American, Hispanic, or other descent)
- ☐ Caribbean (e.g., Jamaican, Guyanese, St. Lucian, or other descent)
- ☐ African (e.g., Ghanaian, Nigerian, Namibian, or other descent)
- ☐ Middle Eastern (e.g., Arab, Persian, Afghan, Egyptian, Iranian, Lebanese, Turkish, Kurdish, or other descent)
- ☐ South Asian (e.g., East Indian, Pakistani, Bangladeshi, Sri Lankan, or other descent)
- ☐ East/Southeast Asian (e.g., Chinese, Japanese, Filipino, Vietnamese, Thai, Malaysian, Indonesian, or other descent)
- ☐ White (e.g., European descent)
- ☐ Prefer not to answer
- ☐ Other (please specify): _____

4. What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school degree or equivalent (e.g., GED)
- Some college/university/vocational school but no degree
- Associate degree
- Bachelor degree
- Graduate degree

5. Please indicate your current occupational status (select all that apply):

- ☐ Student (university, college, vocational)
- ☐ Unemployed
- ☐ Working part-time
- ☐ Working full-time
- ☐ Retired
- ☐ Other (please specify): _____

6. Please indicate your current living situation:

- Living alone
- Living with parents or other family members
- Living with friends or other roommates
- Living with current relationship partner and/or children
- Other (please specify): _____

7. What is your approximate average yearly income within your household?

- $0-$24,999
- $25,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000-$124,999
- $125,000-$149,999
- $150,000-$174,999
- $175,000-$199,999
- $200,000 and up

Family of Origin

The term "***family of origin***" refers to the persons who raised you and whom you spent the most time with during childhood. Sometimes members are directly related to you, sometimes none of the members are related. They did not have to live together in the same house, before or currently, to be considered part of your family of origin. Members do not have to have been present the entire time of your childhood; they don't even have to live in Thunder Bay. So long as they were considered part of your main family at one point and they made an impact on you, they can count as a member of your family of origin.

8. How many people would you consider to be part of your family of origin that you currently have contact with? (do not include members you no longer contact or those who are deceased) Please do not include yourself in the count.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

9. Where do you consider yourself in your family of origin?

- Only child
- Eldest child
- Middle child
- Youngest child
- Other (please specify):

Family of Origin – 10 or more members

Please list your family members, using their RELATIONSHIP TO YOU (e.g., Mother, Foster Father, Grandmother) NOT THEIR NAMES. If there is more than one person with the same relationship, please label them with numbers (e.g.,"Step Mother 1" and "Step Mother 2"). If some of your family members are under the age of 3, please use the prefix "baby" (e.g., "Baby Brother"). If your family of origin consisted of more than 10 members, please list the 10 most important to you.

10. Family member 1: _____

11. Family member 2: _____

12. Family member 3: _____

13. Family member 4: _____

14. Family member 5: _____

15. Family member 6: _____

16. Family member 7: _____

17. Family member 8: _____

18. Family member 9: _____

19. Family member 10: _____

Appendix F

Family Connections Questionnaire

Note. In the "Family Connections" section, this appendix shows the questionnaire how it would display for 10 or more members. Page logic has been applied to the survey such that the response to item #8 leads to a different page, depending on the number of members. The redundant pages "Families Connections – 1 member" through "Families Connections – 9 members" have been omitted.

Note. The syntax {{ Qxx }} refers to the participant's responses of the indicated question being placed in the current question, so that each item/chart is labelled for each family member.

Family Connections – 10 or more members

The following set of questions asks about your relationships with each of your members in your family of origin. Only spend a few moments thinking about each option and choose the one that best suits your gut response. There are no right or wrong answers.

20. How would you describe your current relationship with your {{ Q10 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

21. How would you describe your current relationship with your {{ Q11 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

22. How would you describe your current relationship with your {{ Q12 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

23. How would you describe your current relationship with your {{ Q13 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

24. How would you describe your current relationship with your {{ Q14 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

25. How would you describe your current relationship with your {{ Q15 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

26. How would you describe your current relationship with your {{ Q16 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

27. How would you describe your current relationship with your {{ Q17 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

28. How would you describe your current relationship with your {{ Q18 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

29. How would you describe your current relationship with your {{ Q19 }}?

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
1. How often do you spend fun time with this person?					
2. How often do you tell this person things that you don't want others to know?					
3. How often does this person push you to do things that you don't want to do?					
4. How happy are you with your relationship with this person?					
5. How often do you and this person disagree and quarrel with each other?					
6. How often do you turn to this person for support with personal problems?					
7. How often does this person point out your faults or put you down?					
8. How often does this person praise you for the kind of person you are?					
9. How often does this person get their way when you two do not agree about what to do?					
10. How often does this person not include you in activities?					
11. How often do you and this person go places and do things together?					
12. How often do you tell this person everything that you are going through?					
13. How often does this person try to get you to do things that you don't like?					
14. How much do you like the way things are between you and this person?					
15. How often do you and this person get mad at or get in fights with each other?					
16. How often do you depend on this person for help, advice, or sympathy?					
17. How often does this person criticize you?					
18. How often does this person seem really proud of you?					
19. How often does this person end up being the one who makes the decisions for both of you?					
20. How often does it seem like this person ignores you?					
21. How often do you play around and have fun with this person?					

	Never or hardly at all	Seldom or not too much	Sometimes or somewhat	Often or very much	Always or extremely much
22. How often do you share secrets and private feelings with this person?					
23. How often does this person pressure you to do the things that he or she wants?					
24. How satisfied are you with your relationship with this person?					
25. How often do you and this person argue with each other?					
26. When you are feeling down or upset, how often do you depend on this person to cheer things up?					
27. How often does this person say mean or harsh things to you?					
28. How much does this person like or approve of the things you do?					
29. How often does this person get you to do things their way?					
30. How often does it seem like this person do not give you the amount of attention that you want?					

30. Since March 2020, have you lived with any of the family members you listed?

	Yes, for the entire time	Yes, for some of the time	No
{{ Q10 }}			
{{ Q11 }}			
{{ Q12 }}			
{{ Q13 }}			
{{ Q14 }}			
{{ Q15 }}			
{{ Q16 }}			
{{ Q17 }}			
{{ Q18 }}			
{{ Q19 }}			

Appendix G

COVID-19 Questionnaires

COVID-19 Experience with the Family

Please tell us about your family's experiences during the novel Coronavirus (COVID- 19) pandemic. In answering these questions, please consider family as the members you listed previously.

31. Please tell us about your family's experiences from MARCH 2020 to MARCH 2022 that happened due to COVID-19.

	No	Yes	N/A
1. I had a "stay at home" order			
2. My school physically closed			
3. My education was disrupted (e.g., put on hold, moved to virtual learning)			
4. I was unable to visit or care for a family member			
5. I had to start caring for a family member			
6. People in our family lived separately for health, safety, or job demands			
7. Someone moved out of (or back into) our home			
8. I had to move out of (or back into) our home			
9. Someone in the family kept working outside the home (essential personnel)			
10. Someone in the family/household is a healthcare provider/first responder providing direct care			
11. I/we had difficulty getting food			
12. I/we had difficulty getting medicine			
13. I/we had difficulty getting health care when we needed it			
14. I/we had difficulty getting other essentials (e.g., cleaning supplies, masks, etc.)			
15. I/we self-quarantined due to travel or possible exposure			
16. My/our income decreased			
17. I/another family member had to cut back hours at work			
18. I/another family member was required to stop working (expect to be called back)			
19. I/another family member lost my/their job permanently			
20. I/another family member lost health insurance/benefits			
21. I missed an important milestone event that was canceled or postponed (e.g., my graduation, my prom, my wedding)			
22. I missed an important family event or it was canceled (e.g., birth, funeral, travel [including vacation])			
23. I/another family member was exposed to someone with COVID-19			
24. I/another family member had symptoms or was diagnosed with COVID-19			
25. I/another family member tried to get tested for COVID-19, but couldn't			
26. I/another family member was hospitalized for COVID-19			

	No	Yes	N/A
27. I/another family member was in the Intensive Care Unit (ICU) for COVID-19			
28. Someone in the family died from COVID-19			

32. COVID-19 may have many impacts on you and your family life. In general, how has the COVID-19 pandemic affected each of the following since March 2020?

	Made it a lot better	Made it a little better	Made it a little worse	Made it a lot worse	N/A
1. Being parented					
2. How family members get along					
3. Ability to care for your health					
4. Ability to be independent					
5. Ability to care for others in your family					
6. Your physical wellbeing – sedentary behaviour (lack of movement– screen time, sitting, laying down)					
7. Your physical wellbeing – exercise/ physical activity					
8. Your physical wellbeing – eating					
9. Your physical wellbeing – sleeping					
10. Your physical wellbeing – substance use (smoking/vaping, drinking alcohol, marijuana use, etc.)					
11. Your emotional wellbeing – anxiety/worry					
12. Your emotional wellbeing – mood					
13. Your emotional wellbeing – loneliness					
14. Your social well-being – relationships with friends					
15. Your social well-being – romantic relationships or dating					

33. Overall, how much distress have YOU experienced related to COVID-19?

0 (No distress) 10 (Extreme distress)

34. Overall, how much distress has YOUR FAMILY experienced related to COVID-19?

0 (No distress) 10 (Extreme distress)

Appendix H

Family Resilience Questionnaire

Family Resilience

Please read each statement carefully. Decide how well each statement describes your family now (the members you listed previously) from your viewpoint. There are no right or wrong answers.

35. Please indicate your level of agreement with how well the following statements describe your family now from your viewpoint.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1 Our family structure is flexible to deal with the unexpected				
2 Our friends value us and who we are				
3 The things we do for each other make us feel a part of the family				
4 We accept stressful events as a part of life				
5 We accept that problems occur unexpectedly				
6 We all have input into major family decisions				
7 We are able to work through pain and come to an understanding				
8 We are adaptable to demands placed on us as a family				
9 We are open to new ways of doing things in our family				
10 We are understood by other family members				
11 We ask neighbors for help and assistance				
12 We attend church/synagogue/mosque services				
13 We believe we can handle our problems				
14 We can ask for clarification if we do not understand each other				
15 We can be honest and direct with each other in our family				
16 We can blow off steam at home without upsetting someone				
17 We can compromise when problems come up				
18 We can deal with family differences in accepting a loss				
19 We can depend upon people in this community				
20 We can question the meaning behind messages in our family				
21 We can solve major problems				
22 We can survive if another problem comes up				
23 We can talk about the way we communicate in our family				
24 We can work through difficulties as a family				
25 We consult with each other about decisions				
26 We define problems positively to solve them				
27 We discuss problems and feel good about the solutions				
28 We discuss things until we reach a resolution				

	Strongly Disagree	Disagree	Agree	Strongly Agree
29 We feel free to express our opinions				
30 We feel good giving time and energy to our family				
31 We feel people in this community are willing to help in an emergency				
32 We feel secure living in this community				
33 We feel taken for granted by family members ®				
34 We feel we are strong in facing big problems				
35 We have faith in a supreme being				
36 We have the strength to solve our problems				
37 We keep our feelings to ourselves ®				
38 We know there is community help if there is trouble				
39 We know we are important to our friends				
40 We learn from each other's mistakes				
41 We mean what we say to each other in our family				
42 We participate in church activities				
43 We receive gifts and favors from neighbors				
44 We seek advice from religious advisors				
45 We seldom listen to family members concerns or problems				
46 We share responsibility in the family				
47 We show love and affection for family members				
48 We tell each other how much we care for one				
49 We think this is a good community to raise children				
50 We think we should not get too involved with people in this community				
51 We trust things will work out even in difficult times				
52 We try new ways of working with problems				
53 We understand communication from other family members				
54 We work to make sure family members are not emotionally or physically hurt				

Appendix I

Family Satisfaction Questionnaire

Family Satisfaction

This set of questions asks about how you feel about your life together as a family, with the members you listed above. Please think about your family life over the past 12 months. Read each statement and indicate your level of satisfaction with each item. There is no right or wrong answer.

36. Please read each statement and indicate your level of satisfaction with your family life.

	Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
1. How satisfied am I that my family enjoys spending time together?					
2. How satisfied am I that my family has the support we need to relieve stress?					
3. How satisfied am I that my family members have friends or others who provide support?					
4. How satisfied am I that my family members have transportation to get to the places they need to be?					
5. How satisfied am I that my family members talk openly with each other?					
6. How satisfied am I that my family members have some time to pursue our own interests?					
7. How satisfied am I that our family solves problems together?					
8. How satisfied am I that my family members support each other to accomplish goals?					
9. How satisfied am I that my family members show that they love and care for each other?					
10. How satisfied am I that my family has outside help available to us to take care of special needs of all family members?					
11. How satisfied am I that my family gets medical care when needed?					
12. How satisfied am I that my family has a way to take care of our expenses?					
13. How satisfied am I that my family is able to handle life's ups and downs?					
14. How satisfied am I that my family gets dental care when needed?					
15. How satisfied am I that my family feels safe at home, work, school, and in our neighbourhood?					

Appendix J

Qualitative Item

Final Comments

37. Please tell us any additional comments or thoughts that you have considered while performing this study. This could be about other effects of COVID-19 on you and your family, connections with family members, or your satisfaction with your family-of-origin, whether negative and/or positive.

Appendix K

Demographic Variables Statistics

Table 1

Mean (M) and Standard Deviation (SD) of Continuous Demographic Variables.

Variable	*M*	*SD*
Age	20.89	2.64
Family Size	4.85	2.39

Table 2

Number and Percentages of Categorical Demographic Variables.

Gender	*n*	%
Male	36	24.20
Female	108	72.50
Transgender	2	1.30
Nonbinary	3	2.00

Note. Categories have been combined; participants had ten options to check all that may apply.

Table 3

Number and Percentages of Participants by Ethnic Descent.

Ethnic Descent	*n*	%
European	107	71.80
Indigenous	5	3.40
African	11	7.40
Other	15	10.10
Two or more	11	7.40

Note. Categories have been combined; participants had ten options to check all that may apply. European = White, Indigenous = Indigenous, African = African, Caribbean, Middle Eastern, Other = Latinx, South Asian, East/Southeast Asian, Other, Two or More = when participants selected more than one option (most only selected two, one participant selected three).

Table 4

Number and Percentages of Participants by Occupation.

Occupation	*n*	%
Unemployed	2	1.30
Working Full-Time	5	3.40
Working Part-Time	23	15.40
Student	40	26.80
Retired	0	.00
Other	2	1.30
Student + Unemployed	7	4.70
Student + Full-Time	64	43.00
Student + Part Time	6	4.00

Note. Participants had six options to check all that may apply, and the participants who indicated two checkboxes are indicated in the "Student +" categories.

Table 5

Number and Percentages of Participants by Education Level categories.

Education Level	*n*	%
Less than high school degree	0	.00
High school degree or equivalent	56	37.60
Some post-secondary schooling but no degree	74	49.70
Associate degree	8	5.40
Bachelor degree	6	4.00
Graduate Degree	5	3.40

Table 6

Number and Percentages of Participants by Current Living Situation categories.

Living Situation	*n*	%
Living alone	16	10.70
Living with family	88	59.10
Living with friends/roommates	25	16.80
Living with partner and/or children	20	13.40

Table 7

Number and Percentages of Participants by by Average Household Income categories.

Annual Household Income	*n*	%
$0 - $24,999	34	22.80
$25,000-$49,999	12	8.10
$50,000 - $74,999	24	16.10
$75,000 - $99,999	25	16.80
$100,000 - $124,999	14	9.40
$125,000 - $149,999	5	3.40
$150,000 - $174,999	13	8.70
$175,000 - $199,999	5	3.40
$200,000 or more	15	10.10
Missing	2	1.30

Table 8

Number and Percentages of Participants by Birth Order.

Birth Order	*n*	%
Only Child	17	11.40
Eldest Child	58	38.90
Middle Child	29	19.50
Youngest Child	45	30.20

Table 9

Frequency of Family Structures Broken Down by Family Size

Family Size	Family Structure												Total	
	Single Parent		Nuclear Family		Extended Family		Blended Family		Additional Family		No Parent Family			
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)
1	2	40.00	0	0.00	0	0.00	0	0.00	0	0.00	1	33.30	3	2.00
2	2	40.00	11	14.70	0	0.00	0	0.00	0	0.00	0	0.00	13	8.70
3	1	20.00	28	37.30	2	8.30	2	13.30	0	0.00	0	0.00	33	22.10
4	0	0.00	23	30.70	3	12.50	5	33.30	1	3.70	0	0.000	32	21.50
5	0	0.00	8	10.70	10	41.70	4	26.70	3	11.10	1	33.30	26	17.40
6	0	0.00	4	5.30	8	33.30	1	6.70	2	7.40	0	0.00	15	10.10
7	0	0.00	0	0.00	1	4.20	1	6.70	3	11.10	0	0.00	5	3.40
8	0	0.00	0	0.00	0	0.00	0	0.00	3	11.10	0	0.00	3	2.00
9	0	0.00	0	0.00	0	0.00	1	6.70	1	3.70	0	0.00	2	1.30
10 +	0	0.00	1	1.30	0	0.00	1	6.70	14	51.90	1	33.30	17	11.40
Total	5	3.40	75	50.30	24	16.10	15	10.10	27	18.10	3	2.00	149	100

Appendix L

Coefficient Statistics for the Additional Subgroup Analyses

Table 1

Statistics for Domain and Subscale Models when Member Type Subgroup Analysis is Mother.

Model Coefficients	Coefficient Statistics		
	b	*t*	*p*
Domains			
Positive	0.23	6.90	<.001**
Negative	-0.09	-2.31	.022*
Subscales			
Compassion	0.08	1.9	0.060
Intimiate Disclosure	0.06	1.52	0.131
Satisfaction	-0.02	-0.51	0.612
Emotional Support	0.05	0.94	0.350
Approval	0.03	0.72	0.471
Pressure	-0.01	-0.10	0.919
Conflict	-0.07	-1.56	0.120
Criticism	0.0	1.35	0.178
Dominance	-0.01	-0.21	0.833
Exclusion	-0.14	-3.60	<.001**

* $p < .05$, ** $p < .007$

Table 2

Statistics for Domain Regression Model when Member Type Subgroup Analysis is Sibling.

Model Coefficients	Coefficient Statistics		
	b	*t*	*p*
Positive	.13	2.54	.013*
Negative	.03	.50	.620

* $p < .05$

Table 3

Statistics for Domain Regression Model when Member Valence Subgroup Analysis is Balanced.

Model Coefficients	Coefficient Statistics		
	b	*t*	*p*
Positive	.26	2.09	.039*
Negative	-.09	-.79	.430

* $p < .05$

Table 3

Statistics for Domain and Subscale Models when Member Living Status Subgroup Analysis is Living the Entire Time with the Participant.

Model Coefficients	Coefficient Statistics		
	b	*t*	*p*
Domain			
Positive	0.311	5.154	<.001**
Negative	-0.120	-2.133	0.036*
Subscales			
Compassion	0.090	1.000	0.321
Intimiate Disclosure	0.064	0.821	0.415
Satisfaction	0.118	1.745	0.085
Emotional Support	0.012	0.164	0.870
Approval	0.017	0.162	0.872
Pressure	0.054	0.579	0.565
Conflict	-0.079	-1.089	0.280
Criticism	0.132	1.506	0.136
Dominance	-0.090	-0.938	0.351
Exclusion	-0.153	-2.423	0.018*

* $p < .05$, ** $p < .017$