How Does Economic Pressure Relate to Family Processes?

A Systemic Test of the Family Stress Model

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including

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Abstract

Background: When evaluating family well-being, it is important to disentangle dyadic, individual, and family-wide variability. Presently, few studies have considered the role of social disadvantage and mental health across different levels of family analysis. **Methods:** Canadian families ($N = 224$, including 55% Canadian-born and 45% immigrant mothers) were observed interacting in a round-robin design. Families included mothers, fathers, and two children, aged 5-9 (younger sibling) and 9-13 years (older sibling). Each family dyad (6 total) completed a co-operative building task for 5 minutes and both members were coded for expressed positivity (12 directed dyadic scores per family). Mothers self-reported depressive symptoms and both parents reported children's emotional problems. The social relations model was fit and tested in association with socioeconomic status and individual mental health. **Results:** Significant variance in family positivity across dyadic, individual, and whole-family levels was observed. Socioeconomic status was primarily related to family variations in positivity, while individual mental health was related to positivity for mothers and older children. When individual and family variance components were dropped from the model, certain family relationships were most strongly related to individual mental health, though the pattern of results is less interpretable. **Conclusions:** This study provides support for multilevel conceptualizations of family life. Socioeconomic status is a family-wide risk factor that relates to whole-family differences in positivity and individual-specific mental health symptoms. Individual mental health is associated with individual differences in expressed positivity during family interactions. Implications for clinical landscapes, theory, and methodology in developmental and family science are discussed.

Keywords: family systems, social relations model, family stress, dyadic data analysis, parent-child, mental health, economic pressure, latent variable modelling, positivity

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Literature Review

Socioeconomic status (SES) is a stable predictor of long-term well-being for both

individuals (Keating & Hertzman, 1999; Marmot & Allen, 2014; World Health Organization,

2008) and families (Browne et al., 2015; Walsh, 2016a). Within family studies research, a

multitude of literature has evaluated family dynamics in relation to economic risk factors and a

handful of studies have explored these processes at multiple levels of family analysis. However,

to date, limited work has sought to coalesce these lines of work with a discussion of family

studies literature from both theoretical and methodological viewpoints. Thus, this review will

address three primary areas of research related to the study of families and economic status,

providing: (1) an overview of the detrimental consequences of economic pressure on individuals

and families, as posited by the family stress model (Conger et al., 1994a); (2) a family systems

justification for the study of families across individual, dyadic, and whole-family layers of

organization (Cox & Paley, 1997); and (3) a clarification surrounding the utility of the social

relations model for exploring multi-level family dynamics (Kenny et al., 2006). Thus, the

following review aims to outline the theoretical basis for and statistical procedures amenable to

multi-level family analysis in the context of economic pressure.

Economic Resources and Family Well-Being

The Family Stress Model

The family stress model (FSM; Conger & Conger, 2002; Conger et al., 1994a) provides a

framework for understanding the relationships between socioeconomic disadvantage and parent,

child, and family well-being across development (Kavanaugh et al., 2018; Neppl et al., 2016).

These effects are hypothesized to operate through risk for parental depression, strain on couple

relationships, and lower quality parent-child interactions. In this context, reduced warmth and

enhanced levels of hostility can manifest across multiple relational levels (i.e., couple and parent-child interactions) due to stress arising from economic pressure (Conger et al., 2002).

Economic pressure occurs when families experience a disparity between existing resources and those required to provide for their families in a way that effectively meets their needs (Conger et al., 1994a; Masarik & Conger, 2017). In this context, an absence or limited number of financial resources significantly enhances parental stress, creating vulnerabilities towards mental health challenges. These disruptions in emotional health, as a function of economic pressure, are postulated to create a more negative family environment, by making parents more prone to relational conflict at the marital level. With enhanced hostility and lower levels of warmth within couples, maladaptive communication techniques may be both modeled to and directed towards children, spilling over into the parent-child dyad. Relational challenges may prompt the use of harsh and/or insensitive parenting towards children, creating reciprocal feedback loops that could disrupt positive engagement, or incite confrontational or negative communication styles from children towards parents (Masarik & Conger, 2017). In this way, the contextual environment of the family (i.e., economic resources) can inform both individual well-being and relational dynamics between family members (Browne et al., 2015).

The collective impacts of disadvantage on the family system are understood to have far reaching implications for childhood well-being that are observable in the early years and extend to health in later life (Repetti et al., 2002). The putative effects of SES on developmental health are pervasive, multifaceted and cut across layers of organization (epigenetic, neurophysiological, psychological), but are often contextualized within the global domain of positive psychological adjustment (Conger & Conger, 2002, Conger et al., 2002; Hertzman & Boyce, 2010; Keating, 2016). These impacts include emotional health and externalizing and internalizing problems in

childhood (Neppl et al., 2016; Peverill et al., 2021) and risk for depression in adulthood (Kavanaugh et al., 2018). Thus, stress is thought to cascade from parents to children and across the family unit, contributing to a pattern of family interactions that is suboptimal for well-being (Masarik & Conger, 2017). In these contexts, with an amplified level of negativity between parents and children, children are exposed to a less positive and nurturing family environment and may demonstrate higher levels of internalizing symptoms, in addition to lower positive adjustment in personal, social, and academic functioning (Conger et al., 2002).

Psychological Mediating Mechanisms for Parents. The burdens surrounding economic pressure for parents include challenges with job security, disparities between income and needs, and access to resources, among others (Masarik & Conger, 2017). Practically, this may translate to the physical demands of working long hours, multiple jobs, and increased vulnerability to exhaustion and compromised health (Stack & Meredith, 2018). Furthermore, the impact of economic pressure may present itself most prominently in the psychological burden of providing for one's family and concerns about income security, child and family well-being, and long-term stability (Conger & Conger, 2002).

Understandably, economic pressure has been strongly associated with compromised mental health outcomes, primarily increased anxiety and depression (Masarik & Conger, 2017). With looming financial concerns, emotional distress is a prevalent response, and can lead to experiences of hopelessness and discouragement, among other depressive symptoms like difficulty sleeping and suicidal ideation (American Psychiatric Association, 2013; Masarik & Conger, 2017; Stack & Meredith, 2018). The risk for parent mental health challenges is particularly high when the experience of economic pressure is protracted in nature or when parents face additional stressors such as single parenting, low social support, housing insecurity,

or lower educational attainment (Barnett, 2008; Deater-Deckard, 2012; Stack & Meredith, 2018). Additionally, the risk for depressive and anxiety symptoms may be further heightened for parents who have a personal or family history of mental health challenges and these, in turn, also create amplified risk for family-wide vulnerabilities (Goodman et al., 2011).

In this context, parents may have less energy and lower emotional bandwidth to effectively solve interpersonal conflicts and may be more vulnerable to insensitivity and hostility towards their partner. Experiences of economic pressure have been associated with reduced marital satisfaction and negative perceptions of one's marriage/relationship, in addition to expressions of conflict and hostility, across a diverse range of couple backgrounds and ages (Masarik & Conger, 2017). Amidst this experience, couples may employ unhelpful emotion communication and management strategies that not only impact their relationship but may also be modeled to children (Masarik & Conger, 2017).

Additionally, within the parent-child relationship, the experience of these challenges may also negatively skew parent self-perceptions of effectiveness in parenting and their ability to manage their children effectively, while also working to cope with their own challenges (Scaramella et al., 2008a). Cumulatively, these stressors make parents prone to hostile or coercive parenting, in addition to differential parenting between siblings (Jenkins et al., 2003). Economic stress may also become observable through reductions in positive parenting behaviours such as sensitive responding and instrumental and emotional nurturance, and/or increases in negative or unhelpful parenting behaviours such as ineffective, inconsistent, or harsh disciplinary practices (Benner & Kim, 2010; Robila & Krishnakumar, 2005; Smith et al., 2018). These effects are critical, given that parenting style may shape overall family dynamics more powerfully than children's responsivity towards their parent(s) (Sokolovic et al., 2021). Thus,

the effects of economic stress on parents are particularly important to consider as a predictor of family-wide well-being.

Family Relationships. Economic pressure strains the fabric of family life, amplifying experienced stress from factors external to the family within the family system (Browne et al., 2015). One study found that household income accounted for approximately 28% of family-level sensitivity in family interactions (Sokolovic et al., 2021). Enhanced stress related to psychosocial risk renders whole families vulnerable to less positive (Emmen et al., 2013; Lunkenheimer et al., 2020; Neppl et al., 2020), less sensitive/responsive (Browne et al., 2016), and more negative interactions (Conger et al., 1994b). In this context, family members are less attuned to one another's needs and less able to adaptively respond to them.

Pathways within the FSM have been demonstrated in families with children of varying ages, including toddlers and young children (Derlan et al., 2019; Emmen et al., 2013; Neppl et al., 2016; Scaramella et al., 2008a; Smith et al., 2018), school-aged children (Neppl et al., 2016; Zhang et al., 2020), as well as adolescents and young adults (Benner & Kim, 2010; Conger et al., 1992; Kavanaugh et al., 2018; Kim & Um, 2018; Neppl et al. 2015; Yoder & Hoyt, 2005). On a broader scale, the FSM has also been widely tested in ethnically and structurally diverse families (Masarik & Conger, 2017), with widespread empirical support across populations, including European minority (Emmen et al., 2013), Asian (Benner & Kim, 2010; Kim & Um, 2018), African American (Conger et al., 2002; Landers-Potts et al., 2015), and Latino (Parke et al., 2004; Safa et al., 2020; White et al., 2015) samples, as well as those with non-nuclear family types involving custodial grand-families (Smith et al., 2018), adolescent mothers (Derlan et al., 2019) and remarried couples (Laxman et al., 2019).

Family Positivity. Expressed positivity can take numerous forms, including social

support, attentiveness, warmth, cooperation, and clear communication, among other behaviours

(Ackerman et al., 2011), and may be expressed verbally or through non-verbal forms of support,

like physical affection (Zemp et al., 2016). Studies have found that expressed positivity in family

interactions is a critical component of relational and individual well-being. Despite this

association, positivity in the family context has received markedly less attention in the literature,

compared to negative family transactions. Families experiencing economic pressure are

particularly vulnerable to less-positive family interactions over time. One family study found that

economic pressure, when children were two years old, was negatively associated with both lower

parent positivity and lower positive parenting when children were three to four years old (Jeon &

Neppl, 2019). This vulnerability is critical given that positive relational dynamics between

family members serve to promote healthy development across all levels of the family system

(Ackerman et al., 2011; 2013) and can offer a form of resilience by bolstering family

connectedness (Walsh, 2016b). In particular, the overall pattern of positivity in both interparental

and parent-child interactions (and their frequency relative to negative interactions) is a key

predictor of children's well-being, including positive adjustment, prosocial behaviours, and

emotional health (Zemp et al., 2014; 2019). Further, expressions of support and constructive

behaviours during conflict can also have positive impacts on child emotional well-being across

development (Repetti et al., 2002) and a positive family climate in adolescence predicts

positivity in marriage relationships during adulthood (for both spouses; Ackerman et al., 2013).

Positivity within Family Subsystems. The importance of expressed positivity has also

been evidenced in specific relationships across the family unit. Dispositional positivity (positive

outlook, optimism, self efficacy, and life satisfaction) in parents influences that of adolescents

through nurturant parenting (Neppl et al., 2015). As such, dispositional positivity in parents may buffer children and families from the detrimental impacts of economic pressure, through the maintenance of healthy relationships. Relatedly, nonverbal positivity from both mothers and fathers and verbal positivity in mothers offset the deleterious effects of negative family transactions, specifically considering child perceived threat and insecure family representations from interparental conflict (which families facing economic pressure are especially vulnerable to; Zemp et al., 2016). Additionally, positive interaction dynamics within sibling relationships— including affection (Gass et al., 2007), closeness (Melby et al., 2008) and support (Conger et al., 1994a)—are protective factors that may buffer the impacts of parent hostility and economic pressure as they relate to disturbances in child emotional well-being and academic attainment (Kramer et al., 2019). Therefore, positivity is a noteworthy construct to consider when evaluating family relationships in the context of economic pressure, particularly given the strong associations between experienced stress, increased threat to relational well-being, and mental health outcomes.

Child-specific Outcomes. It is undisputed that disruptions in parent well-being and the parent-child relationship compromise child developmental health across the lifespan (Repetti et al., 2002). Children in families experiencing economic pressure face increased challenges towards psychosocial development because of these vulnerabilities, with increased risks for lower self esteem, higher levels of distress, and reduced levels of happiness (Sobolewski & Amato, 2005; Kavanaugh et al., 2018; Repetti et al., 2002). The stress that accompanies economic pressure and its related strain on families has deleterious effects that exacerbate risk for adverse outcomes in numerous domains including, academic engagement (Simons & Steele, 2020) and achievement (Benner & Kim, 2010), behavioural dysregulation (Lunkenheimer et al.,

2020), cognitive and linguistic development, and psychosocial functioning (Benner & Kim, 2010; Repetti et al., 2002).

Furthermore, these risks may extend beyond childhood, into adolescence and young adulthood, enhancing long-term vulnerabilities within adolescent adjustment (Conger et al., 1992; El-Sheikh et al., 2019), suicidal ideation (Yoder & Hoyt, 2005), adolescent and young adult substance use (Diggs & Neppl, 2018; Martin et al., 2019), risk for psychopathology (Kavanaugh et al., 2018; Wickrama et al., 2008) and challenges to physical health (East et al., 2020; Lupien et al., 2000) across the lifespan. The consequences from economic pressure on families, within and across generations, may also extend to grandchildren (Scott et al., 2020).

Evaluating Multiple Levels of the Family System

To appropriately disentangle the multifaceted consequences of economic pressure across the family unit, all family members and relationships must be considered in tandem. Due to the challenges of family-wide designs (e.g., cost, logistics, statistics), most tests of the family stress model have focused on certain relational subsystems or only one child in a family; this precludes an evaluation of sibling differences and limits the analysis to between-family comparisons (i.e., across households but not within them; Browne et al., 2019). Multilevel family analysis enables a comprehensive view of family well-being, disentangling unique points of vulnerability for individuals and specific family relationships, in the context of economic pressure.

Family-Wide Science

According to family systems theory (Carr, 2012; Cox & Paley, 1997), the whole family is a unique and emergent entity that is *greater than the sum of its parts* (Eichelsheim et al., 2009; Minuchin, 1981). From this theoretical viewpoint, communication between family members is

the vehicle through which family dynamics emerge (Watzlawick et al., 1967). Over time, these

transactions form relatively stable patterns that can be empirically identified (Cox & Paley, 1997;

Jambon et al., 2019; Neppl et al., 2020). Within this framework, the family is both a system and

a unit of analysis that is composed of multiple interacting individuals (parents and children) and

relational subsystems (marital, parent-child, and sibling; Bevelas & Segal, 1982).

Family systems theory has been intensively applied within clinical practice for decades

under multiple modalities of family therapy (Bateson et al., 1956; Carr, 2012; Lebow &

Diamond, 2019; Minuchin, 1974; Satir, 1967; White & Epston, 1990). However, its application

and inclusion within research designs, including developmental science, has been much more

limited. Calls for a whole-family and family systems orientation to marriage and family research

date to the 1980s but have been stalled by several statistical and methodological limitations

(Deković & Buist, 2005; Miller et al., 1982; Persram et al., 2019). Most notably, these included

the complexity of studying interdependence within family relationships (where members hold

unique and non-interchangeable roles), and the historical availability of appropriate tools by

which to analyze this sort of data (e.g., validated measurement tools, behavioural coding

methodology, multilevel/structural equation modeling, and the advent of dyadic data analysis;

Bavelas & Segal, 1982; Cowan et al., 1997; Manders et al., 2007).

Recent literature has highlighted the uniqueness and importance of family-wide approaches

in developmental science (Browne et al., 2015; Plamondon et al., 2018). Browne et al. (2019)

illustrate the role of family-wide clustering when analyzing family dynamics over time,

presenting evidence that interaction dynamics at the whole-family level, if unaccounted for, may

obscure or mischaracterize family dynamics. For example, what may initially appear as a sibling

training effect of one child on another, becomes smaller but more robust when accounting for

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time-invariant similarities between siblings in the same family (Daniel et al., 2019). In other words, the observed magnitude of associations between family members over time is influenced by whether family-wide factors are included within a statistical model. Thus, when attempting to study specific family patterns without a family-wide lens and methodology, important relational processes can be missed or misinterpreted. Furthermore, identified patterns of relationship influence may be epiphenomenal to broader, unassessed whole-family dynamics (Ackerman et al., 2011). Notably, the relationship between individual and family-level influence on familial relationships is not stagnant throughout the lifespan and family-wide factors may be most influential for youngest children and those in early to middle childhood (Browne et al., 2016; Sokolovic et al., 2020; 2021). By studying the facets of well-being that uniquely emerge within the family system, this provides a more unified and contextual perspective of child, parent, and family development over time.

Numerous studies have provided an examination of economic pressure and the FSM in relation to certain family subsystems, namely, the parent-child, sibling, and marital dyads (e.g., Jeon, 2017; Masarik et al., 2016; Neppl et al., 2015; Parke et al. 2004; Puff & Renk, 2014). However, markedly fewer family studies overall have provided an analysis across multiple levels of organization, with consideration of family-wide influences (e.g., Browne et al., 2016; 2019; Oliver & Pike, 2018; Pike et al., 2016; Plamondon et al., 2018), and few studies to date have evaluated whole-families in the context of economic pressure (e.g., Sokolovic et al., 2021). This omission is problematic, as family systems theory indicates that a comprehensive understanding of family life requires a simultaneous integration of multiple dyads (relationships), individuals, and whole-family processes (Bavelas & Segal, 1982; Browne et al., 2015; Cox & Paley, 1997).

That is, when only mothers and children (or singular dyads like the marital unit) are considered, our understanding of family-wide processes and family environments is incomplete.

Directionality of Effects in Family Relationships and Mental Health

Despite a plethora of evidence demonstrating the putatively causal mechanisms within the FSM (Masarik & Conger, 2017), the directionality of effects in this context are challenging to disentangle. Existing literature has outlined the presence of a linear developmental cascade from economic pressure, to relationship quality, to individual (usually child) mental health (Conger & Conger, 2002; Neppl et al., 2016). However, there is some research demonstrating that socioeconomic disadvantage and poverty both precede and follow poor mental health (Knifton & Inglis, 2020; McDaid et al., 2008) and numerous other lines of work have highlighted the bidirectionality of interaction processes within family transactions (Cook & Kenny, 2005; Sameroff & Mackenzie, 2003; Sokolovic et al., 2020). For example, parent mental health challenges have been associated with fluctuations in children's positive and negative affect and behaviours (Goodman et al., 2011; Kavanaugh et al., 2018). Further child emotional health and stress reactivity influence supportive parenting (Scaramella et al., 2008b) and parent emotional well-being (Brooker et al., 2015; Goodman et al., 2011). In this way, parent and child mental health may synergistically correspond to the quality of family-wide relationships, particularly in the context of economic pressure which renders families more susceptible to stress.

The relational features that characterize the parent-child relationship are co-constructed between parents and children, through ongoing transactions that reinforce expressed behaviours (Paschall & Mastergeorge, 2015). To consider the parent-child relationship as a unidirectional paradigm of power and influence of parents over children discounts existing literature evidencing

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child-effects on parents and the reciprocal nature of interaction dynamics (Sokolovic et al., 2020). Furthermore, siblings also engage in mutually reinforcing exchanges, despite differences in age and birth-order, and may influence one another through their interactions over time. For example, Jambon et al. (2019) found evidence of reciprocal levels of empathic concern between younger and older siblings.

In this way, though stressors may follow a cascade framework, they are also likely to be mutually reinforcing over time. This bidirectionality is especially true for studying whole families, which in contrast to other social groups, share both genetic similarity and living environments; both of which have been found to substantially contribute to variability in family behaviours (Lanz et al., 2015; Rasbash et al., 2011). Though stress on the family unit related to economic pressure is thought to be experienced by the entire family, the ways in which that stress impacts the family differs across members and subsystems (e.g., mothers vs fathers, parents vs, children, and between siblings; Browne et al., 2015; 2016).

Insights from the Social Relations Model

The social relations model (SRM) is an analytical approach that allows for the statistical flexibility required for multi-level family analysis (Kenny et al., 2006). In this framework, it is possible to easily organize and interpret multiple, directed relationship scores (i.e., dyadic data) into family-wide, individual, and dyadic sources of variability.

Model Overview

The SRM, originally developed by Kenny and La Voie (1984), is a robust statistical framework for analyzing general group dynamics. It is considered the gold standard for studying relational processes in families because it can account for shared variance (or nonindependence)

between group members (Eichelsheim et al., 2009). This approach allows for a comprehensive

understanding of family relationships, where family members are considered to have

distinguishable roles (e.g., mother, father & child or children) within the family unit, despite

their inseparability from the family as an emergent whole (Kashy & Kenny, 1990; Kenny et al.,

2006). In this way, members have unique identities that contribute to the fabric of the family life,

while remaining embedded within relationships and interactions within the family system. To

account for the reciprocal nature of family interactions, the SRM utilizes dyadic data analysis

which enables the view of family relationships as bidirectional systems. For example, a mother-

child interaction is considered as consisting of two components: the mother's behavior towards

the child and the child's behavior towards the mother. Furthermore, when a round-robin design is

employed, where all family members interact with all the others, it becomes possible to

concurrently evaluate multiple relational systems simultaneously (e.g., parent-child, couple, and

sibling; Kashy & Kenny, 1990).

SRM Components

Within the SRM literature, families with three to four family members have received the

most empirical attention (most commonly, parents with one to two children). Statistically, the

SRM decomposes dyadic (i.e., directional) relationship scores into family, individual (actor,

partner), and relationship sources of variability (Kenny et al., 2006). The *family* effect is a global

assessment of relational dynamics across the family, often described as an ambient relational

quality of the family. Leaning on the concepts of holism (Michaelson et al., 2016) and family

systems theory (Cox and Paley, 1997), the family-level effect is considered a reflection of the

overall family environment. *Actor* effects are an individual's general pattern of acting towards all

other family members, and are considered a function of personality, personal history, or other

individual-level variables (Delsing et al., 2003). Also at the individual level, *partner* effects are

how an individual is typically treated by their family members (i.e., the interactions that are

directed towards them). Lastly, *relationship* effects describe the variability in relationships that is

unique to each dyad. These are the particular adjustments that an individual makes in response to

their interaction partner, after accounting for the role of actor, partner, and the whole-family

effect(s). In single-measurement, cross-sectional designs, relationship effects also contain error

variance (Kenny et al., 2006).

The SRM artfully decomposes every directed relationship score into the aforementioned

components (Cook, 2015; Kenny et al., 2006). For example, a father's positivity toward the

youngest child is a function of his general level of positivity (his actor effect), how positively

people generally behave towards the youngest child on average (the partner effect), the average

level of positivity in the family overall (the family effect), and any unique expressions of

positivity (more or less) based on the father-youngest child dyad (the relationship effect).

In keeping with the bidirectional nature of family relationships, the SRM is also able to

measure the relationship between an individual's pattern of behaviour towards others and their

patterns of being received by those family members. This is called individual or *generalized*

reciprocity (Kenny et al., 2006). For example, generalized reciprocity would represent the

correlation between the actor and partner effects for fathers. Similarly, among dyadic

interactions, the SRM can help to evaluate whether similarity exists in the unique relational

adjustments between members, called *dyadic reciprocity*. To calculate a measure of dyadic

reciprocity, the father's relationship effect would be correlated with the corresponding

relationship effect from the family member he is interacting with (i.e., the younger child in the

above example). In total, a family SRM with four members produces four actor effects, four

partner effects, four generalized reciprocities, 12 relationship effects, six dyadic reciprocities, and one family effect (Kenny et al., 2006).

Current Findings with the SRM

Eichelsheim et al. (2009) reviewed existing research on family SRM studies across constructs, with self-report and round robin designs. In reference to the significantly larger body of family studies research, the mere 19 studies included in this international review, demonstrates that a paucity of research has applied this statistical approach to the study of families. Within this review, actor effects (e.g., individual tendencies) accounted for 34-42% of variance in family affectivity and influence between family members. Likewise partner effects were associated with 15-17% of variance in this context, typically accounting for a smaller proportion of variance in individual behaviour. Concerning relationships, the amount of variance that was accounted for by relationship-specific adjustments differed depending on the relationship of interest within the family unit: the marital subsystem (34-50%), the sibling subsystem (26-44%) or the parent-child relationship (8-31%). In this way, relationship effects were typically greatest in magnitude within intragenerational relationships. Finally, the whole family effect (e.g., overall family environment) accounted for 8-18% of the variance in family positivity; however, this varied depending on which member of the family was considered. In previous literature, the whole family has had a more significant influence on younger children compared to other family members (Browne et al., 2016). Furthermore, regarding bidirectionality, Eichelsheim et al. (2009) also found inconsistent patterns of reciprocity across constructs, but Kenny et al. (2006) found evidence of significant generalized reciprocity for negativity between fathers and adolescent children, and dyadic reciprocity for negativity, specifically within the marital subsystem.

Family studies with the SRM have been widely applied across diverse populations including those in the Netherlands (Branje, 2008; Delsing et al., 2003), Italy (Lanz et al., 2006), and the United States (Cook, 2001; Hoyt et al., 2005; Hsiung & Bagozzi, 2003). Numerous studies have implemented the SRM with college-age children or adolescents (Ackerman et al., 2011; Cook et al., 1998; Eichelsheim et al., 2009; Paleari et al., 2011; Schrodt & Afifi, 2016) but fewer have implemented the SRM with multiple caregivers and young children (The following studies are notable exceptions: Browne et al., 2016; Martin & Ross, 2005; Ross et al., 2005; Sokolovic et al., 2021).

Conclusion

Overall, a substantial body of literature has evaluated the tenants of family systems and FSM-related frameworks, and a handful of studies have studied family dynamics with the SRM; however, very few lines of work (e.g., Browne et al., 2016; Sokolovic et al., 2020) have integrated these frameworks within the same research study. As a result, numerous facets of family organization and family-related disadvantage have been independently explored but research that expands these areas is still significantly lacking. Presently, it is unclear how the FSM operates across hierarchical levels of family organization. That is, the nature of positive family processes across individual, relationship-specific, and whole-family levels amidst economic pressure, has yet to receive significant empirical attention. Further, the mental health of both parents and children, and its relationship to family-wide positivity and economic pressure also requires further investigation. The following sections will include an abbreviated introduction comprising elements from this literature review that are contextualized within the research questions and gaps in the literature that inspired my master's thesis. Subsequently, the Methods, Results, and Discussion sections will outline how I addressed these areas of inquiry,

the findings that were observed, and their implications for theory and clinical practice within this discipline.

How the Family Stress Model informs Multi-level Family Well-being

The family stress model (FSM; Conger & Conger, 2002; Conger et al., 1994a) provides a framework for understanding the relationships between economic pressure and parent, child, and family well-being over time (Kavanaugh et al., 2018; Neppl et al., 2016). Economic pressure occurs in families when there is a disparity between existing resources and those that are required to effectively meet family needs (Masarik & Conger, 2017). When families face a curtailed or limited number of financial resources, parents are increasingly vulnerable to increased stress and emotional disturbances. These disruptions may stem from increased daily hassles, concerns about making-ends-meet, and other work-related burdens, all of which contribute to the risk for parental depression and anxiety (Emmen et al., 2013; Kavanaugh et al., 2018; Masarik & Conger, 2017). In this context, parents may have less energy and lower emotional bandwidth to effectively solve interpersonal conflicts, which may precipitate insensitivity, irritability, and hostility towards their partner (Masarik & Conger, 2017; Scaramella et al., 2008a). Critically, relational disruption in the context of economic pressure is not isolated to the marital relationship and these challenges can also elicit less nurturant and more hostile parenting within the parent-child relationship (Conger et al., 2002; Kavanaugh et al., 2018). The resultant impacts of these processes on children are postulated to have far-reaching consequences for child well-being, with interpersonal consequences that reverberate across multiple relational levels in the family system (Neppl et al., 2016; Plamondon et al., 2018; Repetti et al.. 2002).

Economic pressure also strains the fabric of family life more generally, amplifying experienced stress from factors external to the family within the family system (Browne et al.,

2015). Enhanced stress related to psychosocial risk renders whole families vulnerable to less positive (Emmen et al., 2013; Lunkenheimer et al., 2020; Neppl et al., 2020), less sensitive/responsive (Browne et al., 2016), and more negative interactions (Conger et al., 1994b). For example, one study found that household income accounted for approximately 28% of family-level sensitivity in family interactions (Sokolovic et al., 2021). In this context, financial stress is thought to cascade from parents to children and across the family unit through parent mental health challenges and lower quality communication exchanges, contributing to a pattern of family interactions that is suboptimal for well-being (Masarik & Conger, 2017).

The putative effects of SES on the family system are pervasive, multifaceted and are understood to have far reaching implications for childhood well-being that are observable in the early years and extend to health in later life (Kavanaugh et al., 2018; Repetti et al., 2002). These impacts cut across layers of organization in development (epigenetic, neurophysiological, psychological), but are often contextualized within the global domain of positive psychological adjustment (Conger & Conger, 2002; Conger et al., 2002; Hertzman & Boyce, 2010; Keating, 2016). In these contexts, with an amplified level of negativity between parents and children, children are exposed to a less positive and nurturing family environment and may demonstrate lower positive adjustment in personal, social, and academic functioning (Conger et al., 2002). This includes emotional health and internalizing problems in childhood (Neppl et al., 2016; Peverill et al., 2021), and risk for depression in adulthood (Kavanaugh et al., 2018). In this way, the contextual environment of the family (i.e., economic resources) can inform both individual well-being and relational dynamics between family members (Browne et al., 2015)

Positivity as a Vulnerability for Families facing Economic Pressure

Studies have found that expressed positivity in family interactions is a critical component of relational and individual well-being. Despite this association, positivity in the family context has received markedly less attention in the literature, compared to negative family transactions. Expressed positivity can take numerous forms, including social support, attentiveness, warmth, cooperation, and clear communication, among other behaviours (Ackerman et al., 2011), and may be expressed verbally or through non-verbal forms of support, like physical affection (Zemp et al., 2016). Families experiencing economic pressure are particularly vulnerable to less-positive family interactions over time. One family study found that economic pressure, when children were two years old, was negatively associated with both lower parent positivity and lower positive parenting when children were three to four years old (Jeon & Neppl, 2019). This vulnerability is critical given that positive relational dynamics between family members serve to promote healthy development, across all levels of the family system (Ackerman et al., 2011; 2013) and can offer a form of resilience by bolstering family connectedness (Walsh, 2016b). In particular, the overall pattern of positivity in both interparental and parent-child interactions (and their frequency relative to negative interactions) is a key predictor of children's well-being, including positive adjustment, prosocial behaviours, and emotional health (Zemp et al., 2014; 2019). Further, expressions of support and constructive behaviours during conflict can also have positive impacts on child emotional well-being across development (Repetti et al., 2002), and a positive family climate in adolescence predicts positivity in marriage relationships during adulthood (for both spouses; Ackerman et al., 2013).

Positivity within Family Subsystems. The importance of expressed positivity has also been evidenced in specific relationships across the family unit. Dispositional positivity (positive

outlook, optimism, self efficacy, and life satisfaction) in parents influences that of adolescents through nurturant parenting (Neppl et al., 2015). As such, dispositional positivity in parents may buffer children and families from the detrimental impacts of economic pressure, through the maintenance of healthy relationships. Relatedly, nonverbal positivity from both mothers and fathers and verbal positivity in mothers offset the deleterious effects of negative family transactions, specifically considering child perceived threat and insecure family representations from interparental conflict (which families facing economic pressure are especially vulnerable to; Zemp et al., 2016). Additionally, positive interaction dynamics within sibling relationships— including affection (Gass et al., 2007), closeness (Melby et al., 2008), and support (Conger et al., 1994a)—are protective factors that may buffer the impacts of parent hostility and economic pressure as they relate to disturbances in child emotional well-being and academic attainment (Kramer et al., 2019). Therefore, positivity is a noteworthy construct to consider when evaluating family relationships in the context of economic pressure, particularly given the strong associations between experienced stress, increased threat to relational well-being, and mental health outcomes.

An Empirical Justification for Family-Wide and Bidirectionality Research

Multilevel family analysis enables a comprehensive view of family well-being, disentangling unique points of vulnerability for individuals and specific family relationships in the context of economic pressure. According to family systems theory (Carr, 2012; Cox & Paley, 1997), the whole family is a unique and emergent entity that is *greater than the sum of its parts* (Eichelsheim et al., 2009; Minuchin, 1981). Within this framework, the family is both a system and a unit of analysis that is composed of multiple interacting individuals (parents and children) and relational subsystems (marital, parent-child, and sibling; Bevelas & Segal, 1982). Numerous

studies have provided an examination of economic pressure and the FSM in relation to certain family subsystems, namely, the parent-child, sibling, and marital dyads (e.g., Jeon, 2017; Masarik et al., 2016; Neppl et al., 2015; Parke et al. 2004; Puff & Renk, 2014). However, markedly fewer family studies overall have provided an analysis across multiple levels of organization, with consideration of family-wide influences (e.g., Browne et al., 2016; 2019; Oliver & Pike, 2018; Pike et al., 2016; Plamondon et al., 2018), and few studies to date have evaluated whole-families in the context of economic pressure (e.g., Sokolovic et al., 2021). This omission is problematic, as family systems theory indicates that a comprehensive understanding of family life requires a simultaneous integration of multiple dyads (relationships), individuals, and whole-family processes (Bavelas & Segal, 1982; Browne et al., 2015; Cox & Paley, 1997). That is, when only mothers and children (or singular dyads like the marital unit) are considered, our understanding of family-wide processes and family environments is incomplete.

Recent literature has highlighted the uniqueness and importance of family-wide approaches in developmental science (Browne et al., 2015; Plamondon et al., 2018). Browne et al. (2019) illustrate the role of family-wide clustering when analyzing family dynamics over time, presenting evidence that interaction dynamics at the whole-family level, if unaccounted for, may obscure or mischaracterize family dynamics. For example, what may initially appear as a sibling training effect of one child on another, becomes smaller but more robust when accounting for time-invariant similarities between siblings in the same family (Daniel et al., 2019). In other words, the observed magnitude of associations between family members over time is influenced by whether family-wide factors are included within a statistical model. Thus, when attempting to study specific family patterns without a family-wide lens and methodology, important relational processes can be missed or misinterpreted. Furthermore, identified patterns of relationship

influence may be epiphenomenal to broader, unassessed whole family dynamics (Ackerman et al., 2011). By studying the facets of well-being that uniquely emerge within the family system, this provides a more unified and contextual perspective of child, parent, and family development.

Despite an abundance of evidence demonstrating the putatively causal mechanisms within the FSM (Masarik & Conger, 2017), the directionality of effects in this context are challenging to disentangle. Existing literature has outlined the presence of a linear developmental cascade from economic pressure, to relationship quality, to individual (usually child) mental health (Conger & Conger, 2002; Neppl et al., 2016). However, there is some research demonstrating that socioeconomic disadvantage both precedes and follows poor mental health (Knifton & Inglis, 2020; McDaid et al., 2008) and numerous other lines of work have highlighted the bidirectionality of interaction processes within family transactions (Cook & Kenny, 2005; Sameroff & Mackenzie, 2003; Sokolovic et al., 2020). For example, child emotional health and stress reactivity influences supportive parenting (Scaramella et al., 2008b) and parent emotional well-being (Brooker et al., 2015; Goodman et al., 2011). In this way, parent and child mental health may synergistically correspond to the quality of family-wide relationships, particularly in the context of economic pressure which renders families more susceptible to stress.

The relational features that characterize the parent-child relationship are co-constructed between parents and children, through ongoing transactions that reinforce expressed behaviours over time (Paschall & Mastergeorge, 2015). To consider the parent-child relationship as a unidirectional paradigm of power and influence of parents over children discounts existing literature evidencing child-effects on parents and the reciprocal nature of interaction dynamics (Sokolovic et al., 2020). In this way, though stressors may follow a cascade framework, they are also likely to be mutually reinforcing over time. This bidirectionality is especially true for

studying whole families, which in contrast to other social groups, share both genetic similarity

and living environments; both of which have been found to substantially contribute to variability

in family behaviours (Lanz et al., 2015; Rasbash et al., 2011).

How the Social Relations Model enables a Systemic Test of Family Systems Theory

The social relations model (SRM) is an analytical approach that allows for the statistical

flexibility required for multi-level family analysis (Kenny et al., 2006). Originally developed by

Kenny and La Voie (1984), the SRM accounts for shared variance (or nonindependence)

between group members (a frequent challenge in family studies research) and because of this, it

is considered the gold standard for studying relational processes in families (Eichelsheim et al.,

2009). The SRM allows for a comprehensive understanding of family relationships, where

family members are considered to have interdependent yet distinguishable roles (e.g., mother,

father, and child or children) within the family unit, despite their inseparability from the family

as an emergent whole (Kashy & Kenny, 1990; Kenny et al., 2006). In this way, members have

unique identities that contribute to the fabric of the family life, while remaining embedded within

relationships and interactions within the family system. With the use of dyadic data, this

framework is able to disentangle multi-level family processes and enables an analysis of family

relationships as bidirectional systems.

Statistically, the SRM decomposes dyadic (i.e., directional) relationship scores into

family, individual (actor, partner) and relationship sources of variability (Kenny et al., 2006).

The *family* effect is a global assessment of relational dynamics across the family, often described

as an ambient relational quality of the family. Leaning on the concepts of holism (Michaelson et

al., 2016) and family systems theory (Cox and Paley, 1997), the family-level effect is considered

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a reflection of the overall family environment. *Actor* effects are an individual's general pattern of

acting towards all other family members, and are considered a function of personality, personal

history, or other individual-level variables (Delsing et al., 2003). Also at the individual level,

partner effects are how an individual is typically treated by their family members (i.e., the

interactions that are directed towards them). Lastly, *relationship* effects describe the variability

in relationships that is unique to each dyad. These are the particular adjustments that an

individual makes in response to their interaction partner, after accounting for the role of actor,

partner, and the whole-family effect(s). In single-measurement, cross-sectional designs,

relationship effects also contain error variance (Kenny et al., 2006).

The SRM artfully decomposes every directed relationship score into the aforementioned

components (Cook, 2015; Kenny et al., 2006). For example, a father's positivity toward the

youngest child is a function of his general level of positivity (his actor effect), how positively

people generally behave towards the youngest child on average (the partner effect), the average

level of positivity in the family overall (the family effect), and any unique expressions of

positivity (more or less) based on the father-youngest child dyad (the relationship effect). In

keeping with the bidirectional nature of family relationships, the SRM is also able to measure the

relationship between an individual's pattern of behaviour towards others and their patterns of

being received by those family members. This is called individual or *generalized reciprocity*. For

example, generalized reciprocity would represent the correlation between the actor and partner

effects for fathers. Similarly, among dyadic interactions, the SRM can help to evaluate whether

similarity exists in the unique relational adjustments between members, called *dyadic*

reciprocity. To calculate a measure of dyadic reciprocity, the father's relationship effect would

be correlated with the corresponding relationship effect from the family member he is interacting

with (i.e., the younger child in the above example). In total, a family SRM with four members produces four actor effects, four partner effects, four generalized reciprocities, 12 relationship effects, six dyadic reciprocities, and one family effect (Kenny et al., 2006).

Overall, the SRM offers a statistical avenue by which to evaluate the tenants of family systems theory (which has been extensively applied within family therapy in clinical practice but has stalled in its inclusion within family research designs; Bateson et al., 1956; Carr, 2012; Lebow & Diamond, 2019; Minuchin, 1974; Persram et al., 2019; Satir, 1967; White & Epston, 1990). Despite this method's robustness, little research has applied this statistical approach within family research to date (Eichelsheim et al., 2009), with very few studies employing observational designs (see Browne et al., 2016; Sokolovic et al., 2021; Stevenson et al., 1988), a research gap that this study hopes to close.

The Current Study

This work sought to provide a greater level of specificity to research that has established a harmful relationship between economic pressure and the family system. Specifically, this project sought to disentangle points of vulnerability within families in relation to SES, mental health, and expressed positivity during family interactions. It was also purposed to explore the unique manifestations of positivity across individual family members and relational levels (sibling, couple, parent-child, and whole-family). Most studies of economic pressure within families have not simultaneously evaluated multiple levels of family organization and studies that do isolate sources of variance in family behaviour cannot provide a fulsome analysis of shared versus non-shared risk factors, including mental health symptoms. Furthermore, family interaction research often utilizes self-report designs, which—though valuable—significantly diverge from naturalistic family interactions (Morsbach & Prinz, 2006; Zahidi et al., 2019).

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Samples of adolescents or young adult children are also commonly used, limiting generalizability to families with young children (Barnett, 2008).

Using the SRM as an analytic framework and a family systems theory orientation, the current study employed a round-robin observational design to systemically evaluate the FSM. The study investigated three overarching research questions: (1) Can the SRM describe the observed data and, if so, which components of the family system are the most important predictors of family positivity?; (2) How do SES and psychopathology relate to observed positivity vis-à-vis the SRM components?; and (3) Are there specific individuals and relationships in the family that are particularly associated with fluctuations in SES?

Hypotheses

Based on previous literature, significant actor, partner, relationship, and whole-family variances were expected, supporting the SRM framework. Specifically, small but significant partner variances were expected (Kenny et al., 2006), as well as substantial variance in family positivity across dyads that was accounted for by family-level variance. Dyadic reciprocities and generalized reciprocities were expected to be significant across all paired dyads, and individuals, respectively. Informed by the FSM (Conger et al., 1994a), a cascade was hypothesized, such that the experience of limited financial resources would correspond to compromised mental health and reduced expressions of positivity across observed relationships in the family system. Negative relationships were hypothesized between SES and the mental health statuses of mothers and children, and between emotional challenges and expressed positivity of both actors overall and actors in specific dyadic relationships. In light of the FSM framework that hypothesizes that economic pressure is inversely related to family outcomes through hampered parental sensitivity,

maternal depression was expected to negatively predict expressed positivity towards fathers and

between family members across the family unit.

Methods

Study Sample

Data were obtained from a longitudinal birth cohort called the *Kids, Families, and Places* study. All study procedures were approved by the Research Ethics Board at the University of Toronto and informed consent was obtained from all study participants. Participants were recruited from Toronto and Hamilton between 2013 and 2015. This study had four inclusion criteria: (1) an English-speaking mother; (2) a newborn with a birth weight of at least 1,500g; (3) at least one other child in the family that was born no more than four years prior; and (4) participant consent to have biological and observational data collected in their home by the study team. Participants were recruited immediately following the birth of their youngest child through a province-wide public health program called *Healthy Babies, Healthy Children.* Of the mothers who were eligible to participate in the study ($N = 501$), those who did not participate included participant refusals, ineligibility after contact, and inability to contact the participant. Though this study included some families with more than two children (19% of families had three children, 4% had four children), only four family members were evaluated (mother, father, and the two youngest children) due to participant burden and cost. Although participants come from a longitudinal cohort, this thesis is confined to data collected at one wave of data collection. The sample for this work included 224 families, of which, 12% ($n = 26$) were single-mother families. All families were included in the analyses, but due to sample size, separate analyses were not conducted for single-mother families.

All the parent dyads in this study were heterosexual couples. Of the children who did participate in the study, the newborn at the time of study recruitment (called the younger sibling) was aged 5-9 years at the time of data collection ($M = 7.3$, $SD = 0.8$) and their next sibling

closest in age (called the older sibling) was between the ages of 9-13 years ($M = 9.8$, $SD = 1.1$). A near-even split of males and females were included in the study sample of younger (49% male) and older children (53% male). Approximately one-quarter of sibling pairs were male-male (25%) or female-female pairs (23%) and approximately half of the sibling pairs were mixed-sex (52%). On average, mothers were aged 40.9 years ($SD = 4.4$) and fathers were aged 43.8 years ($SD = 5.0$).

Caregiver education was assessed in years, excluding kindergarten. Mothers and fathers had comparable education levels, with the average parent having completed university or college-level education (mothers: $M = 15.9$ years, $SD = 2.5$; fathers: $M = 15.8$, $SD = 2.5$). This study included both Canadian-born (55%) and immigrant mothers (45%) who were of European (58%), South Asian (15%), East and South Asian (13%), Black (6%) and mixed or other (9%) descent. Sample demographics were comparable to the Toronto and Hamilton Census, though participants in this study demonstrated a slightly higher level of education and a slightly lower level of economic risk.

Measures

Socioeconomic Status

Income was assessed using income bands of $10,000, where the median income was $95,000 to $104,999 ($IQR = $55,000-64,999 to $105,000+$). For families where income was not reported ($n = 15$, 7%), assets were utilized as an indicator of SES. Assets were calculated for each household based on parents' responses to the following questions: (1) How many rooms do you have in your house?; (2) Do you own or co-own this home/apartment/unit, even if still making payments? (Yes = 1 or No = 0); and (3) Do you own or co-own a car, even if still

making payments? (Yes = 1 or No = 0). Responses to these items were coded such that affirmative responses as well as higher reported income and rooms-in-the-home values reflected higher scores, then standardized and averaged into a composite measure of economic status (*n* = 223).

Maternal Depression

Maternal depressive symptoms were measured utilizing the *Centre for Epidemiological Studies Depression scale* (CES-D; Radloff, 1977). Mothers were asked to answer 20 questions related to their affective state throughout the last week (e.g., *I felt depressed*) that were rated from 0 (*rarely or none of the time*) to 3 (*most or all of the time*). These items were summed across the measure to produce an overall score, with higher scores indicating greater risk and the presence of depressive symptomatology (range 0-60). In this measure, scores over 16 typically indicate the presence of clinically significant depressive symptoms. For mothers whose questionnaires had multiple missing items, the mean value of the completed items was taken and appropriately scaled. Cronbach's alpha for CES-D scores across the sample was .85. Additional details regarding mean scores for study measures can be found in Table 1.

Child Emotional Problems

Emotional problems in both children were assessed via parent report with scales from the Ontario Child Health Study (OCHS; Boyle et al., 1993). Parents were asked to answer questions rated from 0 (*Never or not true*) to 2 (*Often or very true*) about their child's behaviour during the past six months. The scales included seven items assessing internalizing behaviours (e.g., seems to be unhappy, sad, or depressed). Item scores were summed together to create a total score, with higher scores indicating the presence of more problems. Both parents were asked to report on the

emotional problems of each child and parent scores were averaged to create a mean of both

mother's and father's report which were significantly correlated for both younger and older

children (younger children: $r(154) = .32$, $p < .001$; older children: $r(154) = .49$, $p = <.001$). For

families where father's report was not available for either child (55 cases, 25%), solely maternal

report was utilized. Two cases (<1%) did not have available maternal report on children's

emotional problems and as such, the father's report values were utilized in the final analysis.

Cronbach's alphas were .72 and .74 for mothers' and fathers' reports, respectively.

Observed Positivity

To assess familial interaction patterns, each family member interacted with all the others

in a round-robin design. Each dyad was observed interacting for 5 minutes while engaging in a

co-operative and developmentally challenging building task adapted from Aguilar et al. (2001).

Dyads were asked to recreate a four-color structure and task difficulty varied across dyads who

interacted in a randomized order. Each member was instructed to utilize only two colors,

requiring cooperation between family members for the task to be completed effectively. There

were four family roles (mother, father, older and younger child), resulting in 12 scores per family

(mother to father, father to mother, mother to older, older to mother, etc.).

The cooperation task was coded using the sensitive responding and mutuality scales from

the *Coding of Attachment-Related Parenting* (CARP; Matias et al., 2006; 2013) measure, and the

positive control scale from the *Parent Child Interaction System* (PARCHISY; Deater-Deckard et

al., 1997; Funamoto & Rinaldi, 2014). Interactions were assessed for the presence of seven

constructs that were combined to create a composite measure of overall positivity, including

mutuality, sensitivity, positive control, on-task behaviour, sociability, enjoyment, and positive

affect. The positive control scale provides a measure of positive influence between family members including praise and open-ended questions. Similarly, the sensitive responding scale includes an assessment of perspective taking, sensitivity to partner signals and emotional states, responsivity to partner needs, encouragement of autonomy, and warmth. Lastly, the mutuality scale covers initiation, interactive-reciprocal play or turn-taking, positive affect matching, mirroring, fluid conversation, and co-ordination of posture between interaction partners. Each member of the dyad was rated on a scale from 1 (*absence of construct of interest*) to 7 (*extreme presence of construct of interest*) for each construct (see Table 1). Coding was conducted by undergraduate research assistants with an expert coder double-coding 10% of interactions to ensure interrater reliability. Reliability was confirmed between coders approximately every 10 families, with expert coders resolving any discrepancies. Interrater reliability between coders was .84-.94 across dyadic scores (Cronbach's alphas, as recommended by Stemler, 2004). Internal consistency for dyadic scores ranged from .72-.79.

Analytical Approach

Descriptive statistics and correlations were assessed using the Statistical Package for the Social Sciences (SPSS) version 26 (see Tables 1-2). SRM analyses were conducted with R Studio version 1.2.5033 (RStudio Team, 2019) and the *lavaan* package for structural equation modeling (Rosseel, 2012). Full information maximum likelihood estimation was utilized to handle missing data (as proposed by Allison, 2003). The sample size of 224 families exceeds the minimum of 200 cases typically recommended for structural equation models and is considered adequate for accurately modeling the *SRM with role*s, with sufficient power (Kenny et al., 2006).

Normality and Missing Data

Several approaches were utilized to assess for multivariate normality in the dyadic interaction data. Of the 221 (of 224) families with dyadic data, the average family had nearly 10 dyadic data points ($M = 9.9$, $SD = 2.8$), and 60% of families had all 12 possible scores. All families had at least 4 dyadic data points, with a subset of families (32-37%) who were missing dyadic scores for some or all interactions with fathers (across interactions with mothers, and both children). Missing data from fathers was due to single-mother status (12%), inability to contact fathers, or dialogue during the interaction task in a language other than English. Across the sample, other missing data was due to participant refusals, technological difficulties related to data collection, and family interactions in a language other than English.

Mahalanobis distance was calculated for the dyadic data which assessed 134 cases, using listwise deletion of cases where families had any missing dyadic scores. This analysis yielded one potential outlier ($p = .001$). Additionally, three cases were included in the dataset where families did not have any dyadic scores but completed the other study measures. All nested models were tested with and without these four cases; fit statistics and parameters did not significantly vary, and as such, they were retained within the model.

To explore the nature of the missing dyadic data, Little's (1998) Missing Completely at Random (MCAR) test was run and a significant result was found, suggesting that the MCAR assumption was rejected, $\chi^2(100) = 126.80$, $p = .036$. Descriptively, the majority of these cases were missing some or all directed dyadic scores for interactions with *fathers* (mother to father, father to mother, father to older child, etc.; see Table 1). To further evaluate the dataset, Little's MCAR test was re-run with a subset of the interaction data (i.e., the six dyadic interaction scores

that did *not* include fathers: mother to older child, older child to mother, older child to younger child, etc.), which yielded a non-significant result, $\chi^2(14) = 11.67$, $p = .633$. These remaining dyads (those with mothers, and older and younger children, but not fathers), only had 3-4% of missing data, across the dataset, which were missing completely at random. Estimation-Maximization imputation was utilized to estimate means for cells with missing data and Mahalanobis distance was recalculated. Using a cut-off value of $p < .001$, nine multivariate outliers were found. When all models were re-run without the inclusion of these outliers, the fit statistics and parameters did not significantly vary, thus, these cases were not excluded. With the exception of Models 1a and 1b ($n = 221$, given the absence of non-dyadic variables in these models), Models 2a-3b included all 224 families.

Nested models

Three separate models were tested in this analysis. The following specifications were utilized to evaluate model fit: A non-significant chi-square test, Comparative Fit Index (CFI) $\geq.95$, Root Mean Square Error of Approximation (RMSEA) $<.06$, and Square Root Mean Residual (SRMR) $<.08$ (Hu & Bentler, 1999; Kenny et al., 2006).

Model 1: The Social Relations Model. The *SRM with roles* (Kenny et al., 2006) was modelled to analyze the data at individual, dyadic and whole-family levels. To construct the whole-family latent variable, all 12 dyadic scores were entered as indicators. Actor and partner variables were created by constructing eight latent variables (two for each role), representing the average directed dyadic score when an individual served as an *actor* or as a *partner.* For example, the mother actor latent variable included the three directed dyadic scores that reflected mothers' expressed positivity towards her other family members (father, and both children).

Likewise, the mother partner variable was constructed by creating a latent variable with the three directed dyadic scores as indicators that reflected the expressed positivity of other family members (father and both children) towards the mother of that family. As is suggested by Kenny et al. (2006), equality constraints were added within each component for the actor, partner, and the whole family latent variables (e.g., for the mother actor latent variable, the loadings for mother to father, mother to younger child, and mother to older child were constrained to equality). Constraining parameters to equality did not worsen model fit. Generalized reciprocities were entered into the model by allowing each individual's actor variable to covary with their respective partner variable. The actor variables of mothers and fathers were allowed to covary, as were the partner variables of mothers and fathers. Likewise, actor variables were allowed to covary between siblings, as were their associated partner variables because intragenerational similarity was expected within the marital and sibling subsystems. All other latent variables were specified as orthogonal. Additionally, six dyadic reciprocities were specified, as it was expected that the directed dyadic scores from each paired dyad would covary (e.g., expressed positivity from mother to older child would covary with expressed positivity from older child to mother, and so on). This model had 35 parameters and was tested singularly to explore whether the data supported the SRM framework (Model 1a, see Figure 2). The complete structural model is visually depicted in Figure 1.

In light of previous findings from a family-specific SRM review that found typically small or non-significant partner effects (Eichelsheim et al., 2009), and the non-significant partner variances in Model 1a, this model was subsequently tested without partner variables (termed Model 1b). In total, this model had 25 parameters.

Model 2: Cascade Linking Economic Pressure and Family Interactions via Individual Psychopathology. After modelling the SRM, subsequent models assessed the role of economic pressure and mental health symptoms within the family system, at different levels of analysis. Using regressions, SES was modeled as a predictor of maternal depression, children's emotional health outcomes, and whole family positivity (which was modeled as a latent variable). Additionally, maternal depression was anticipated to predict emotional well-being in both children, and emotional problems were expected to significantly covary between siblings. Finally, all three mental health variables were modeled as predictors of whole family positivity and individual actor variables (with each member's mental health status independently predicting their overall positivity towards other family members). This model was called Model 2a and is depicted visually in Figure 3. To clarify the role of child's sex in the incidence of emotional problems, child sex was separately added as a predictor of each child's emotional problems for older and younger children in Model 2b. Both Models 2a and 2b utilized data from all families in the dataset. Models 2a and 2b have 42 and 49 parameters, respectively.

Model 3: Cascade Linking Economic Pressure to Dyadic Interactions via Individual Psychopathology. Model 3a explored whether economic pressure and mental health symptoms were significantly associated with specific family relationships. This model sought to evaluate whether any dyads (and directed dyadic scores) were most strongly related to SES and psychopathology. To evaluate how emotional health was associated with family relationships at the dyadic level, actor variables and the family-level variable were removed from Model 2b. Next, each actor's directed dyadic scores were tested in a regression model where that individual's mental health variable was the predictor (e.g., maternal depression predicting interactions from mother to older child, mother to younger child, and mother to father).

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Additionally, to evaluate if SES directly related to family interactions, all 12 directed dyadic scores were regressed onto SES. As in the previous models, dyadic reciprocities were also included. For parsimony, emotional problems for each actor were only mapped to directed dyadic scores where each respective individual was the leading member of the directed dyadic score (see Figure 4). As in Model 2b, to test the role of child's sex on emotional problems, child sex was added as a predictor for both older and younger children in Model 3b. Both Models 3a and 3b utilize data from all families in the dataset and have 109 and 116 parameters, respectively (covariances were unrestricted).

Results

Model 1: The Social Relations Model

Model 1a: The Standard SRM Configuration

In this model, the full *SRM with roles* was specified (Kenny et al., 2006), including a latent family variable, four latent actor variables, four latent partner variables, 12 directed dyadic scores, six dyadic reciprocities, and four generalized reciprocities, $\chi^2(47) = 75.12$, $p = .006$, CFI = .97, RMSEA = .052, SRMR = .067. Then, this model was tested with the addition of four intragenerational covariances (see Figure 2). A likelihood ratio test indicated that the model fit significantly improved with this addition, $\chi^2(4) = 33.56$, $p < .001$. This model (1a) achieved good model fit (see Table 5).

Variance estimates for the SRM components—the whole family, actor (for mothers, fathers, and older children), and all 12 directed relationship scores—were statistically significant (see Table 3). Conversely, the *actor* variance for *younger* children and *partner* variances for *all* members were not significant. Considering this finding, without significant partner variance, the significant generalized reciprocities that were found for mothers and fathers, but not older ($p = .05$) and younger children, are uninterpretable (Kenny et al., 2001). None of the intragenerational correlations between parents and children, for both actor and partner variances were significant in this model.

The percentage of variance accounted for by each SRM component is included in Table 4. To calculate these values, each of the SRM variances (family, actor, partner, and relationship) was calculated as a ratio of each component to the overall total variance of all the combined variables (see Kenny et al., 2006). Family, actor, and partner variances were latent variables, and

relationship variances were calculated as the variance in positivity scores that was unaccounted

for by the family, actor, and partner variances in the model. Therefore, the relationship variances

contain residual unexplained error. Values in Table 4 represent the average variance accounted

for by each SRM component specific to that directed dyadic score. For example, the variance in

expressed positivity from mothers to younger children comprises the overall family level of

expressed positivity (13% family level variance), the mother's consistent pattern of positivity as

an individual (31% actor variance), the child's pattern of positive responding to the mother as a

partner (2% partner variance), and the unique positivity expressed between the mother and her

younger child as a function of their relationship (55% relationship variance, including error),

above and beyond actor, partner, and family variances.

On average, family-level variance accounted for 9-15% of the variance in dyadic scores.

This finding demonstrates that the overall ambient environment of positivity within the family

contributes to the level of positivity within individual relationships between family members.

Further actor variance accounted for 9-32% of variance in expressed positivity in this model,

which suggests that individual behavioural patterns substantially contribute to interaction

dynamics, particularly for mothers, fathers, and older children. The actor variance for youngest

children in this sample was non-significant. Partner variance (though not statistically significant

in this model) accounted for 1-11% of variance. This finding suggests that the patterns of

expressed positivity towards each family member may play a smaller role in driving dyadic

family interactions. Lastly, relationship variance plus error accounted for 48-78% of variance in

dyadic scores. Significant and strong correlations between directed dyadic scores for each dyad

(dyadic reciprocities) were found, ranging from .60-.81, ps $\leq$ .001.

Model 1b: The SRM without Partner Variables

As in Model 1a, in Model 1b, significant variances were found at the family level and for all directed dyadic scores (see Table 3), along with significant correlations for all six dyadic reciprocities (rs = .63-83, ps <.001); however, in contrast to Model 1a, significant actor variances were found for *all* family members in this model. Variance estimates between Models 1a and 1b were comparable. The fit of this model, though still acceptable (see Table 5), slightly worsened with the removal of partner variables (which were non-significant in Model 1a). As another distinction between Models 1a and 1b, mother and father actor variances were significantly correlated in this model (r = .65, p = .001), but actor variances between siblings were not significantly correlated (as in Model 1a). Generalized reciprocities could not be calculated for this model, given the removal of partner variances. Even though this model had slightly worse fit than Model 1a, it was retained for parsimony and interpretability.

Comparing this model to Model 1a (see Table 4), family variance accounted for a slightly larger portion of variance across directed dyadic scores (M = 21%, SD = 3.0) and actor variances accounted for a smaller portion of variance (M = 13%, SD = 5.8); with relationship variances (plus error) accounting for 66% of variance on average (SD = 7.5). In this model, R^2 values were comparable to those in Model 1a (M = .3, SD = .1).

Model 2: Cascade of Economic Pressure to Individual Actors via Psychopathology

Model 2 is depicted visually in Figure 3, along with standardized parameter estimates. The previously reported results for SRM components in Model 1b remained consistent in Model 2a. In this model, higher SES significantly predicted both higher levels of whole family positivity and fewer maternal depression symptoms. Further, SES was negatively associated with

the degree of emotional problems in younger but not older children, whereas maternal depression was significantly and positively associated with emotional problems in older children but not younger children. Emotional problems between older and younger children also significantly covaried. Lastly, mental health symptoms for mothers and older (but not younger) children significantly predicted their respective actor variances, such that higher levels of depressive and emotional symptoms, respectively, were associated with lower levels of expressed positivity.

The maternal depression to mother-actor path was somewhat unstable and became non-significant ($p > .05$) when additional parameters were added to this model. When child sex was added as a predictor of older and younger child emotional problems, the fit improved slightly, and the above reported results from Model 2a remained consistent (see Model 2b, Table 5). Child sex was associated with the level of emotional problems in older but not younger children, such that older boys (aged 9-13 years) were more likely to present with a higher degree of emotional behaviour problems than older girls in this sample ($\beta = -.15$, $p = .011$).

Model 3: Cascade of Economic Pressure to Dyadic Interactions via Psychopathology

To create Model 3a, the actor and whole family variables were removed from Model 2, along with the paths from individual mental health symptoms to the actor variables. Further, paths were added from each individual mental health variable (depressive symptoms for mothers and emotional problems for older and younger children) to dyadic scores where that individual was the leading member of the directed score, and all 12 dyadic scores were regressed onto SES (see Figure 4). The same relationships between SES and mental health symptoms from Models 2a and 2b were found in Model 3a. In this model, SES was significantly and positively

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associated with expressed positivity in all but two directed dyadic scores (younger child to older child and younger child to father).

Unique patterns emerged between individual mental health symptoms and their relationship to expressed positivity towards specific family members within dyadic interactions. Primarily, maternal depression was significantly and negatively related to positivity from mothers towards fathers. For children, emotional problems in older children were negatively associated with expressed positivity from older children towards mothers. Also, emotional problems in younger children were negatively associated with expressed positivity from younger children towards fathers. When child sex was added as a predictor of older and younger child emotional problems, model fit improved slightly, and the above reported results from Model 3a remained consistent (see Table 5). As in Model 2b, child sex was associated with the level of emotional problems in older but not younger children, such that older boys (aged 9-13 years) were more likely to present with a higher degree of emotional problems than older girls in this sample ($\beta = -.15$, $p = .011$).

In summary, significant variations in expressed positivity were found at the individual, dyadic, and whole-family level. Individual mental health had strong associations with SES, in addition to reduced positivity, for older children and mothers. Lower SES was also associated with lower family-wide positivity. Furthermore, SES and mental health symptoms were also significantly associated with the degree of positivity in specific relationships, for both parents and children. This pattern of results suggests that shared economic stress *"gets inside the family"* to influence outcomes at the family-wide, individual, and relationship-specific levels of analysis (Browne et al., 2015, p. 398).

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Discussion

This project sought to explore multi-level vulnerabilities in the family system in relation to mental health and economic pressure. An observational dataset was utilized to systemically evaluate the family stress model (FSM; Conger et al., 1994a) in four-person, two-parent families with young children. A cascading pattern of associations was observed, linking SES and emotional health symptoms for mothers and children to family positivity, across multiple levels of relational organization. This work offers both theoretical and methodological contributions to the literature across the family stress, family systems (Cox & Paley, 1997), and social relations model (SRM; Kenny et al., 2006) frameworks.

Positivity Operates across Levels of Family Organization

These findings demonstrate individual, relationship-specific, and whole-family features of positivity, complementing existing SRMs that depict the family system as an emergent whole, with multidimensional and interdependent components. Within the standard SRM model, actor variances accounted for 9-33% of the differences in expressed positivity between family members (with youngest children in the family having the smallest—and non-significant—actor variances: 9-13%). This finding reflects the intraindividual consistency of oldest family members, likely as a reflection of dispositional factors such as personality and overall interaction style with other family members (Browne et al., 2019). It also affirms the unique and meaningful contributions of fathers within the family system, which operate parallel to (but distinct from) those of mothers within the parental unit (Cabrera et al., 2018). Further, the non-significant actor variances for youngest children in the family align with existing hypotheses of transactional development, whereby younger members of the family are socialized by parents and older

siblings, developing agency and independence in relationships over time (Browne et al., 2016; Sameroff, 2010).

Reflecting the consistency of positivity that was *received* by each family member individually, partner variances in this study were comparably smaller than actor variances and were non-significant overall (1-11%). This finding is consistent with existing family SRM studies (e.g., Ackerman et al., 2011; Eichelsheim et al., 2009; Rasbash et al., 2011) and demonstrates that an individual's patten of being received by other family members has a smaller role in directing relational dynamics within the family system, compared to individual-driven, relationship-specific, and broader whole-family factors. Additional investigation into how, why, and when partner effects are more pronounced is an important future area of consideration in developmental and family systems research.

Family-level variances accounted for 9-13% of differences in family positivity across all family relationships in this study. This result provides support for the ambient relational environment as a noteworthy facet of family life – an emergent relational climate that is co-developed by all family members through their combined dyadic interactions (Browne et al., 2019). The magnitude of this effect is comparable to that found in a family SRM review of self-report designs (8-18% of family-level variance on average; Eichelsheim et al., 2009). Put simply, the relational climate of the family is its own unique phenomenon and one that exerts influence over the positivity expressed between family members, above and beyond individual patterns of interaction and relationship-specific adjustments (Ackerman et al., 2011). Thus, a family-wide lens is critical for the accurate characterization of family dynamics, as the whole is indeed *greater than the sum of its parts* (Eichelsheim et al., 2009; Minuchin, 1981). Stated differently, it

is not possible to understand family dynamics simply by looking at the summative contributions of individuals and relationships within the family unit.

Finally, though the relationship variances in this model are conflated with error (accounting for 48-78% of variance in expressed positivity), the presence of highly significant dyadic reciprocities across all relationships suggests that unique adjustments between family members account for a significant proportion of relationship-specific differences between family members (Ackerman et al., 2011). This reflects the bidirectional nature of positive family interactions (even for young children), which co-evolve as siblings, the marital couple, and parent-child dyads adaptively respond to one another during real-time interactions (Paschall & Mastergeorge, 2015). These associations also reinforce existing findings regarding the role of child-effects on parents and the mutuality of sibling relationships within harmonious family interactions (Jambon et al., 2019; Sokolovic et al., 2020)

Trends in Family Positivity across Stages of Development

These findings complement a handful of observational family SRM studies of positivity-related constructs from infancy to adolescence. Similar patterns in the magnitude of significant actor variances, small or non-significant partner variances, and substantially larger relationship variances have been demonstrated in analyses of child play with infants and young children (12m and 3-4 years of age, Stevenson et al., 1988), and positivity during conflict resolution in families with adolescent children across genetically informed (Rasbash et al., 2011) and longitudinal designs (Ackerman et al., 2011). Cumulatively, these results demonstrate that the unique relational adjustments of each family member towards the others, based on each unique relational context, are the strongest predictor of expressed positivity. Furthermore, they also posit

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that family positivity (e.g., mutuality, positive affect, sensitivity, warmth) is enduring over time (Ackerman et al., 2011) and that parents have a crucial role in initiating structured and co-operative interactions with their children during early childhood (Stevenson et al., 1988). For example, parents prompt child participation (an invitation to reciprocate positive interactions) and relational patterns are established, synergistically changing over time, and becoming more balanced between parent and child, as their level of personal agency grows with age and socialization (Sameroff, 2010). Thus, the co-development of family dynamics may begin and have the greatest magnitude at the dyadic level, evidenced by encouraging, co-ordinated, and reciprocal interactions (or lack thereof) within family relationships. Positivity operates across all-levels of family organization and these results provide a comprehensive picture of positivity, informed by responsivity, warmth, and mutuality in relationships. These multi-level expressions of family positivity depicted by the SRM, reflect the theoretical tenants of family systems theory: family interactions have unique and interdependent features at the individual, subsystem, and whole-family level (Cox & Paley, 1997). These effects remained consistent when SES and individual-specific mental health were considered, confirming previous findings that families facing economic pressure (in this case, lower SES) are systemically disadvantaged across hierarchical levels of family organization (Browne et al., 2016; Sokolovic et al., 2021).

A Family Stress Cascade: Economic Pressure, Mental Health, and Positivity

When tested, the following pathways were supported within the current sample: lower SES demonstrated negative associations with maternal depressive symptoms, which were related to lower levels of expressed positivity from mothers towards fathers and children. These results affirm the putatively causal mechanisms within FSM framework that have been validated by numerous cross-sectional and longitudinal studies in this field (Kavanaugh et al., 2018; Masarik

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& Conger, 2017; Neppl et al., 2015; 2016). Maternal depression was positively associated with levels of SES and inversely related to mother's positivity towards other family members overall. This linkage demonstrates that lower SES and maternal depressive symptoms are associated with detrimental interpersonal consequences for mothers as individuals, a factor that poses risks towards the health of both the marital and mother-child relationship. This result complements prominent FSM findings that demonstrate increased risk for marital conflict in the presence of economic pressure (Conger & Conger, 2002). Similarly, these findings also align with other observational family studies in this field. Emmen et al. (2013) found that general maternal psychological distress in minority families partially mediated the relationship between lower SES and less positive parenting towards their young children. Furthermore, Neppl et al. (2015) found that parent positivity (e.g., self esteem, positive emotions) and observed positive parenting (e.g., warmth, communication, relationship quality), in both mothers and fathers, were associated with adolescent positivity in the context of economic pressure.

Child mental health was also associated with the above-mentioned risk factors (lower SES and maternal depressive symptoms). Socioeconomic status was negatively associated with levels of maternal depression and emotional problems in younger children (aged 5-9 years) but not older children (aged 9-13 years). This result suggests that the number of economic resources available to the family may be a critical risk factor for youngest children's emotional health in particular. Conversely, emotional well-being for older children was consistently associated with maternal emotional health in this study, which may reflect "spillover" between the stress of economic pressure that disrupts both emotional well-being and shared relational exchanges between mother and child (Browne et al., 2016; Masarik & Conger, 2017; Nelson et al., 2009). These findings align with those of a large meta-analysis by Goodman et al. (2011) noting that

children of depressed mothers have exacerbated risks for emotion dysregulation (including

internalizing symptoms) that may be transmitted through numerous avenues, including shared

genetic and social risks (e.g., financial resources), degree of exposure to high negative or low

positive maternal affect, and the health of the couple relationship.

Family-Wide, Individual, and Dyad-Specific Extensions of the FSM

This analysis affirms that the FSM pathways operate in association with family positivity

when children are in middle childhood, extending existing literature on family positivity and

economic stress during adolescence and emerging adulthood (Neppl et al., 2015). This finding

suggests continuity in these family processes across development and complements research on

the amplification of *negative* family transactions in the context of economic pressure (Conger et

al., 1994b). Furthermore, these findings also extend the breadth of the traditional FSM, with

findings that include both mothers and fathers, child-specific effects, reciprocity, and multi-level

family positivity.

Primarily, lower SES was found to correspond to lower positivity at the whole-family

level. This insight broadens the nature of family-stress pathways from singular relationships and

individual outcomes to widespread familial disruption, affirming findings from a SRM analysis

of family sensitivity in the same sample, where family income accounted for 28% of the variance

in sensitive interactions across the family unit (Sokolovic et al., 2021). In this way, lower SES is

a shared risk-factor that is acutely experienced via disruptions to the ambient family environment

in the home. The most prominent hypothesis for family-wide effects surrounds the role of couple

conflict that may strain the parent-child relationship and reverberate in a spillover fashion across

family subsystems; however, these results also accommodate complimentary hypotheses of

child-effects on parents and the reciprocity of reduced positivity across family-relationships, especially in the context of maternal depressive symptoms (Cox & Paley, 2003; Goodman et al., 2011; Masarik & Conger, 2017; Nelson et al., 2009; Sokolovic et al., 2020). Further, when individual mental health symptoms were tested in their relationship to overall family-level positivity, no significant relationship was found. This null result suggests that the emotional health of one individual in the family (at least in this non-clinical sample) did not significantly relate to the overall level of expressed positivity for all family members. That said, individual emotional well-being did relate to how positive family members were as individuals, irrespective of the family-wide effect (for mothers and older children). This finding for mothers affirms existing FSM hypotheses, and the presence of this effect for older children demonstrates that fluctuations in older child positivity (and the positivity that is expressed within older child-family interactions) are related to features of child emotional health. It also highlights the relevant role that older children have within the family system, not only as recipients of family positivity but also meaningful contributors to family dynamics (Masarik & Conger, 2017; Sokolovic et al., 2020).

Finally, dyadic expressions of reduced positivity for children towards parents were found in this sample. Namely, a greater degree of emotional problems for older children was associated with reduced positivity towards mothers, and emotional problems in younger children were significantly associated with lower levels of positivity towards fathers. For older children, this link may reflect reciprocal reductions in positivity, related to co-occurring emotional challenges in both mother and child (Goodman et al., 2011), that attenuate child expectations for positive interactions and inform their own expressed positivity (Madigan et al., 2017). Similarly, within the father-younger child relationship, though youngest children had a non-significant actor

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effect, this result may reflect a relationship-specific curtailing of positivity unique to the father-child dyad in the context of greater internalizing problems. It also highlights the need to include fathers within family and parenting research, and the relevance of father positive engagement for child emotional well-being (American Psychological Association, 2018; McHale et al., 2004; Panter-Brick et al., 2014).

While somewhat more challenging to interpret in isolation, these dyad-specific findings collectively correspond to FSM pathways of family-wide relational disruption in the context of lower SES (Neppl et al., 2016). In tandem, these associations for younger and older children may reflect a sibling clustering effect, whereby both children are predisposed to internalizing symptoms as a function of shared genetic and environmental risk factors (which in this context, include maternal depression, lower SES, and family-wide reductions in positivity; Daniel et al., 2019). These factors may render parent-child interactions less sensitive, less co-ordinated, or less positive in affect overall, a pattern which may then be reciprocated and mirrored across the family unit over time (Nelson et al., 2009; Sokolovic et al., 2020).

In summary, these findings affirm the necessity of a family-wide lens when evaluating family well-being, from both an economic and psychological vantage point. Through consideration of multiple levels of family well-being, the unique contributions of individual family members emerge, along with a view of the whole family as its own unique entity. Overall, individuals, the whole family, and specific family relationships all strongly relate to SES and psychopathology, with family positivity fluctuating in response to changes in these family-wide and individual-specific risk factors. Thus, though the presence of lower SES is experienced across the family context, the pathways through which that stress is made evident uniquely differ across individual family members and relational subsystems (Browne et al., 2015; 2016).

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Limitations and Future Directions

Despite their novelty, these findings have some limitations that highlight the necessity of further research in this domain. A primary limitation of this work includes the absence of data regarding paternal emotional well-being. As such, this work was unable to model the relationship between economic resources, family dynamics, and paternal mental health factors. The FSM (Masarik & Conger, 2017) and broader family interaction (Lunkenheimer et al., 2020) and psychopathology literature (Goodman et al., 2011) supports the mental health of both parents as a critical factor in the maintenance of couple and family well-being. Future studies should explore whether comparable associations between mental health and expressed positivity exist for fathers, as was found for mothers and children in this sample.

Additionally, subjective experiences of economic pressure were not evaluated in this study, leaving unclear how many families were facing financial strain beyond inferences from their objective levels of assets and household income. Future studies should evaluate financial needs-to-income ratios—to obtain a clearer picture surrounding which families may be most at risk for compromised well-being—and further clarify the nature of economic burden(s) in this context (e.g., debt, food insecurity, trouble making ends meet, and not being able to afford one's desired lifestyle; Maselko et al., 2018). Further, in light of the family investment model, future work might consider evaluating broader forms of social disadvantage, such as the availability of learning resources and safety of the family home (Rijlaarsdam et al., 2013; Scaramella et al., 2008a).

Lastly, the variables in this analysis were measured concurrently, which precluded causal conclusions from these findings. Though these findings are comparable to other longitudinal

studies that have been conducted with the FSM framework (Conger & Conger, 2002; Kavanaugh et al., 2018), this field would benefit from additional longitudinal research that combines both the FSM and SRM and consideration of genetic factors. This approach would allow for both within and between family analyses (see, Browne et al., 2019) and further isolation of shared and non-shared family factors across the family life cycle (Manke & Pike, 2008; McGoldrick, 2015).

Novelty and Implications

These findings help address the paucity of literature testing the pathways of the FSM at multiple levels of analysis with the SRM and four family members (see Browne et al., 2016; Sokolovic et al., 2021). This work bolsters existing connections between the components of the FSM by adding nuance to its hypothesized points of vulnerability within the family system (e.g., the whole family, unique family relationships, and children as meaningful contributors to the family system). It also incorporates literature from a developmental science perspective that emphasizes the bidirectional processes of influence that are embedded within parent-child and family-wide relationships. These results are unique in that they model individual mental health and its associations with individual and relational well-being within the family system, specifically with young children. Finally, these findings provide support for multi-system family analysis that considers contextual, relational, and psychological factors in family interactions, and contributes to the sparse literature implementing family-wide science within the empirical study of families, especially in the context of economic risk. Further, the observational design in this study complements a plethora of existing literature utilizing self-report designs across both the FSM and SRM frameworks, and these findings may also inform useful targets of family-wide intervention for families facing social disadvantage.

Clinical Applications

A family-wide orientation to therapeutic interventions is beneficial for gaining a clinical understanding of contextual factors that impact well-being, even in the context of individualized or adult service provision. These findings support the need for interventions that bolster family-wide positivity and psychological well-being within the family system. Specifically, interventions towards maternal mental health may have downstream benefits for family well-being, across all family relationships. Furthermore, a prevention-oriented approach towards maintaining family well-being—that cultivates resilience by strengthening family relationships—may enable families to thrive, despite the experience of economic disadvantage and the presence of parental mental health concerns (Lunkenheimer et al., 2020; Neppl et al., 2015). The present findings most strongly affirm that the degree of risk for adverse outcomes (as opposed to their inevitability) is exacerbated for families with lower SES (Walsh, 2016b). Many families thrive amidst financial adversity, particularly those that maintain strong relationships and make meaning of challenging circumstances (Walsh, 2016a). Thus, this facet of family relationships may be a crucial target for future clinical practice with families facing economic pressure.

These results advance existing literature pertaining to the impact of economic disadvantage on the whole family across multiple levels of organization with the SRM, informing clinical models of service delivery within and beyond family-centred services. They broaden current findings in developmental science and family systems literature, with consideration of multi-parent and multi-child roles in the family, expanding the typical empirical focus on the mother-child relationship. In summary, families are vulnerable to multifaceted and family-wide disruptions in relational well-being that may operate through parent and child mental health challenges in the context of lower SES.

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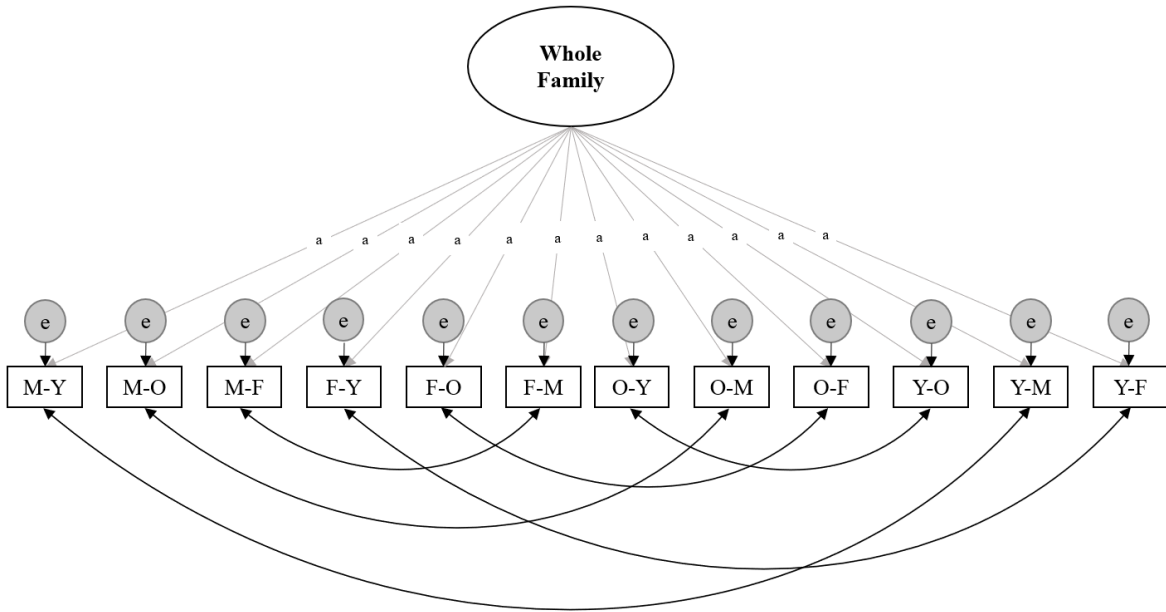
Part 1

Part 2
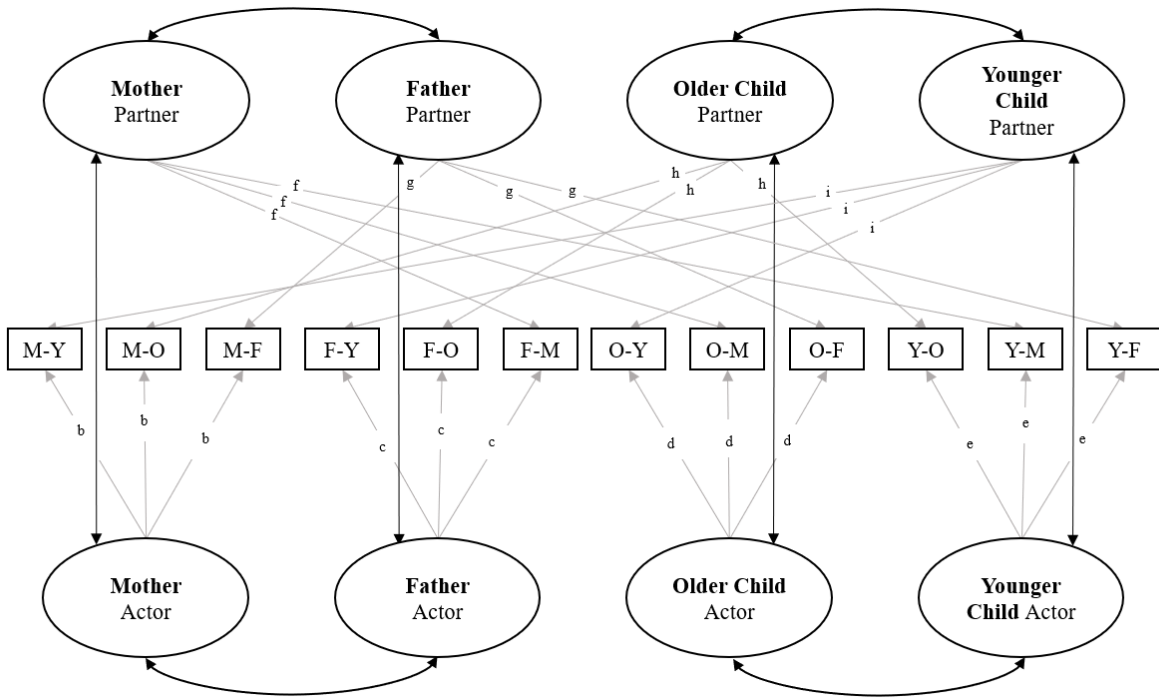
Figure 1. *Structural Model of Expressed Positivity in the Family System*

Note: Parts 1 and 2, when overlayed, reflect the complete structural model. Part 1 depicts the whole family variable and its respective factor loadings (constrained to equality, represented by *a*), dyadic reciprocities, and residual error variances for each dyad. Part 2 depicts actor and partner variables, and their respective factor loadings (*a-i*, constrained to equality), as well as generalized reciprocities and intragenerational correlations. In both components, ovals reflect latent variables, circles reflect residual error, and boxes reflect directed dyadic (observed) scores, notation is as follows: Mother (M), Father (F), Older Child (O), Younger Child (Y). Correlations (and reciprocities) have been depicted with double-sided arrows.
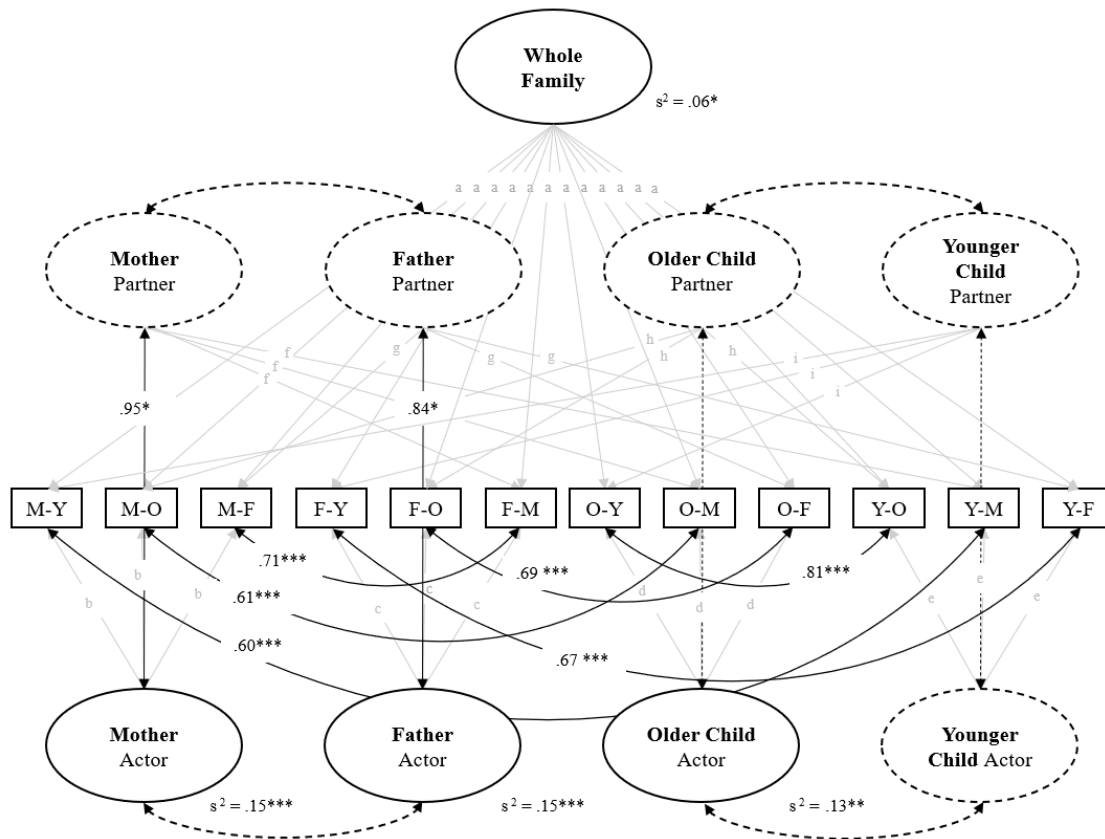
Figure 2. *Measurement Model: Expressed Family Positivity in Model 1a, the Social Relations Model*

Note: Unless specified as variance, standardized estimates are reported. Solid lines indicate significance, dotted lines represent non-significant paths. Double sided arrows reflect covariances.

Ovals reflect latent variables, boxes reflect directed dyadic scores, notation is as follows: Mother (M), Father (F), Older Child (O), Younger Child (Y).

 $* p<.05, **p <.01, ***p <.001$, *a-i* - parameters constrained to equality.
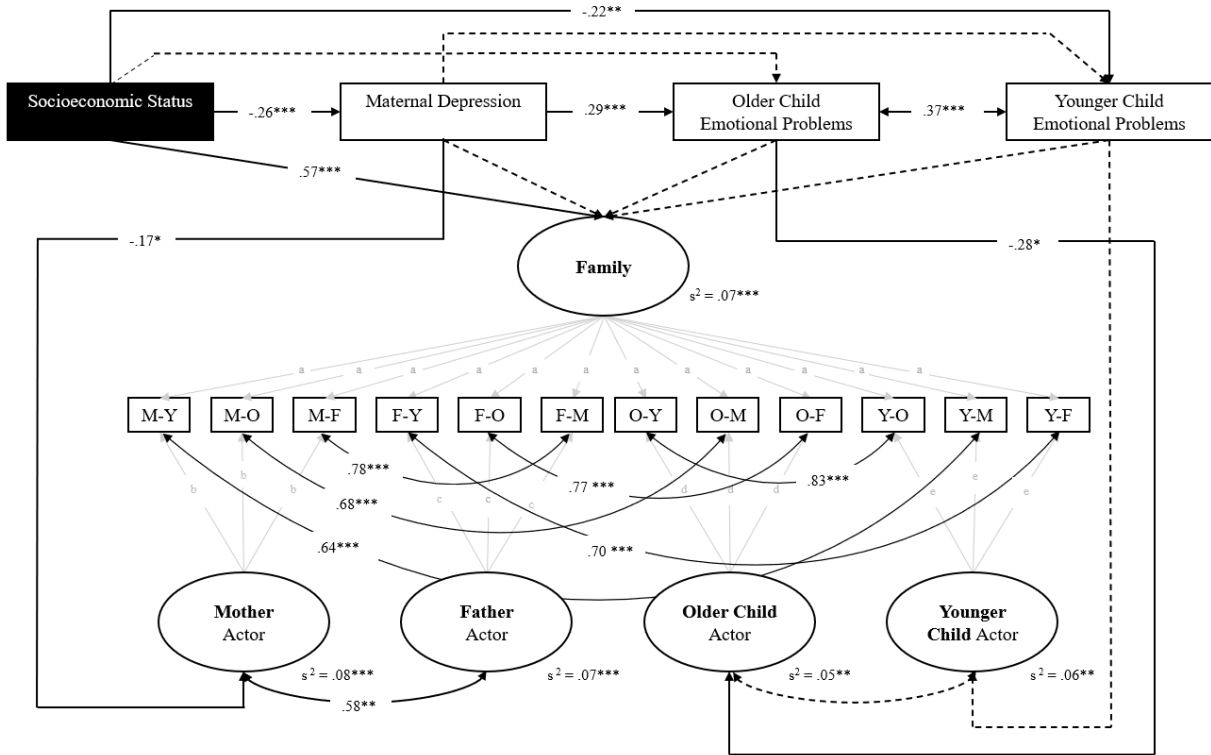
Figure 3 – *Cascade of Disadvantage associated with SES, Individual and Family Positivity, and Compromised Individual Mental Health*

Note: Model 2a. Unless specified as variance, significant standardized estimates are reported (solid lines), dotted lines represent non-significant paths. One-sided arrows represent regressions, double sided arrows reflect covariances.

Boxes reflect directed dyadic scores, notation is as follows: Mother (M), Father (F), Older Child (O), Younger Child (Y).

 * $p<.05$, **$p<.01$, ***$p<.001$, *a-e* = parameters constrained to equality.

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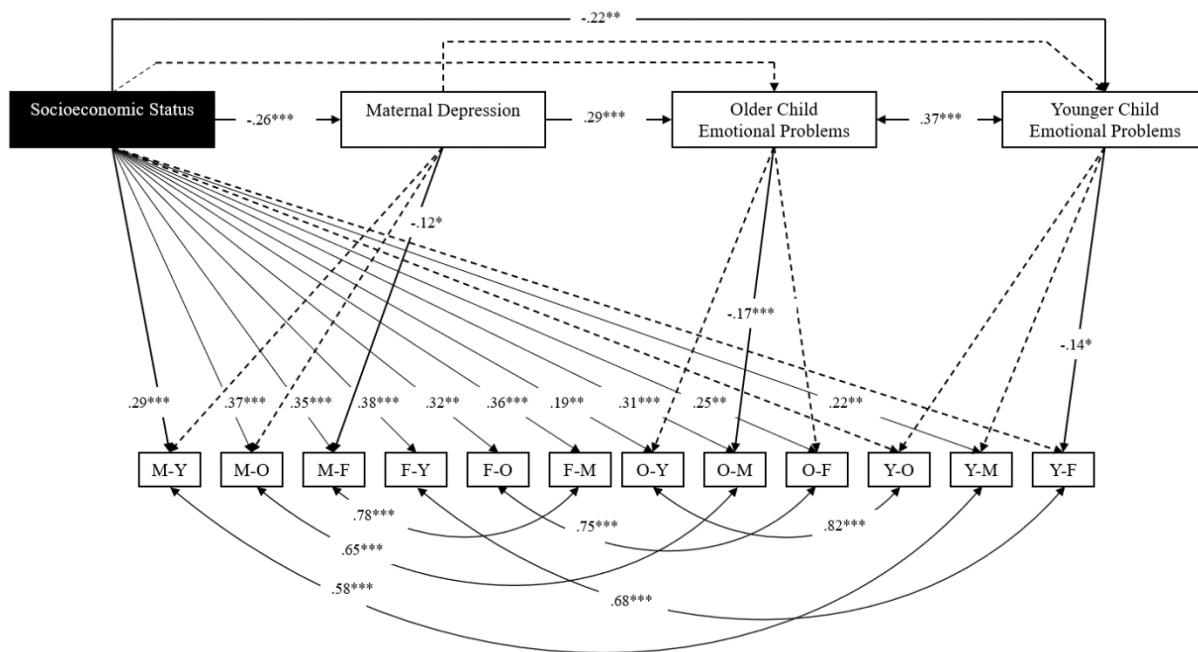
Figure 4. *Cascade of Disadvantage associated with SES, Expressed Positivity in Directed*

Relationships, and Compromised Individual Mental Health

Note: Model 3a. Significant standardized estimates are reported (solid lines), dotted lines

represent non-significant paths. One-sided arrows represent regressions, double-sided arrows

reflect covariances.

Boxes reflect directed dyadic scores, notation is as follows: Mother (M), Father (F), Older Child

(O), Younger Child (Y).

Remaining covariances between dyads have been omitted from model visual for clarity.

 * *p*<.05, **p ≤.01, ***p ≤.001

Table 1

Descriptive Statistics for Primary Variables

	n	Mean	Range	*SD*
SES	223	-0.01	-2.57-0.71	0.79
CES-D Mothers	217	6.88	0-43.00	6.70
Parent Mean OCHS Younger	223	-0.14	-1.48-3.81	0.78
Parent Mean OCHS Older	224	0.27	-1.48-3.81	0.95
M to Y Positivity	215	4.09	2.14-5.71	0.70
M to O Positivity	215	3.95	1.86-5.71	0.76
Y to M Positivity	215	3.72	1.57-5.29	0.65
O to M Positivity	215	3.69	1.71-5.71	0.70
F to Y Positivity	150	4.14	2.43-5.71	0.75
F to O Positivity	153	4.04	2.29-6.14	0.68
Y to F Positivity	150	3.46	1.57-5.00	0.67
O to F Positivity	153	3.62	1.00-6.00	0.71
M to F Positivity	141	4.35	2.00-6.00	0.67
F to M Positivity	141	4.28	2.71-5.57	0.63
Y to O Positivity	217	3.49	1.43-5.71	0.81
O to Y Positivity	217	3.68	1.14-6.43	0.85

Note. For dyadic variables, M= Mother, F = Father, Y = Younger child, O = Older Child

Prior to combining OCHS scores into a composite score, respective parent means for each child were as follows:

Younger – Mother's report: $M = 1.50$, $SD = .34$; Father's report: $M = 1.45$, $SD = .31$

Older - Mother's report: $M = 1.64$, $SD = .39$; Father's report: $M = 1.62$, $SD = .39$

Table 2

Correlation Matrix for all Observed Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. SES	-																
2. Y sex	-.01	-															
3. O sex	-.03	-.04	-														
4. M CES-D	-.27**	.05	-.08	-													
5. Y OCHS	-.24**	.08	-<.01	.18**	-												
6. O OCHS	-.05	-.03	.13	.29**	.38**	-											
7. M to Y Pos.	.30**	.08	.03	-.08	-.17*	-.10	-										
8. M to O Pos.	.38**	-.02	.03	-.20**	-.07	.02	.48**	-									
9. Y to M Pos.	.22**	.10	.04	-.02	-.10	-.12	.60**	.26**	-								
10. O to M Pos.	.31**	-.03	<.01	-.19**	-.10	-.14*	.26**	.68**	.29**	-							
11. F to Y Pos.	.31**	.06	.04	-.09	-.03	.17*	.27**	.19*	.09	.20*	-						
12. F to O Pos.	.23**	-.04	.06	-.02	<.01	.02	.23**	.22**	.15	.27**	.48**	-					
13. Y to F Pos.	.10	.03	.12	-.10	-.07	.11	0.15	-.01	.18*	.15	.67**	.25**	-				
14. O to F Pos.	.19*	-.06	.02	-.08	.06	-.04	.17*	.18*	.23**	.37**	.33**	.76**	.23**	-			
15. M to F Pos.	.27**	.03	-.09	-.17	.06	.11	.20*	.35**	.06	.25**	.25**	.35**	.13	.31**	-		
16. F to M Pos.	.25**	.06	-.03	-.05	.10	.16	.16	.23**	.02	.18*	.38**	.40**	.20*	.26**	.78**	-	
17. Y to O Pos.	.10	.10	.02	-.11	.02	-.11	.01	.09	.21**	.22**	.03	.09	.24**	0.14	-.09	-.06	-
18. O to Y Pos.	.19**	.04	.03	-.18**	.04	-.14*	.05	.21**	.17*	.35**	.08	.18*	.16	.21*	.02	<.01	.82**

Note. M= Mother, F = Father, Y = Younger child, O = Older Child. Pos. = Positivity

*p < .05. **p < .01.

Table 3

Variances for SRM Components in Models 1a and 1b

SRM Component	Variance (1a)	Variance (1b)
Family	.06**	.11***
Actor		
Mother	.15***	.10***
Father	.15***	.09***
Older	.13**	.04**
Younger	.06	.04**
Partner		
Mother	.02	-
Father	.05	-
Older	.02	-
Younger	.01	-
Relationship		
Mother to younger	.27***	.29***
Mother to older	.30***	.34***
Younger to mother	.29***	.30***
Older to mother	.25***	.31***
Father to younger	.33***	.35***
Father to older	.22***	.26***
Younger to father	.30***	.34***
Older to father	.28***	.33***
Mother to father	.26***	.30***
Father to mother	.23***	.26***
Younger to older	.51***	.52***
Older to younger	.53***	.58***

Note. Unstandardized estimates reported. Relationship variances reflect residuals after actor,

partner, and family effects have been accounted for.

Younger = younger child, Older = older child.

Variance 1a and Variance 1b respectively refer to models 1a and 1b

*p <.05, **p <.01 ***p <.001

Table 4

Percentage of Variance in Directed Dyadic Scores Accounted for by SRM Components in

Models 1a and 1b

Relationship	SRM Component			Relationship and Error	R^2
	Family	Actor	Partner[a]		
Model 1a					
Mother to younger	13	31	2	55	.46
Mother to older	12	28	4	56	.45
Younger to mother	14	13[a]	5	68	.33
Older to mother	13	28	5	55	.46
Father to younger	11	27	2	60	.40
Father to older	14	33	5	48	.52
Younger to father	13	12[a]	11	64	.36
Older to father	12	25	10	53	.47
Mother to father	12	29	10	50	.50
Father to mother	13	32	5	50	.50
Younger to older	9	9[a]	4	78	.22
Older to younger	9	18	1	72	.28
Model 1b					
Mother to younger	21	20	-	59	.41
Mother to older	19	18	-	62	.38
Younger to mother	23	9	-	67	.33
Older to mother	23	9	-	68	.32
Father to younger	19	16	-	65	.35
Father to older	23	19	-	58	.42
Younger to father	22	9	-	70	.30
Older to father	22	8	-	70	.30
Mother to father	21	20	-	59	.41
Father to mother	23	19	-	57	.43
Younger to older	16	6	-	78	.22
Older to younger	15	6	-	80	.20

Note. Values have been rounded for clarity, absolute values for family, actor, partner and

relationship (+ error) variances sum to 100. Younger = younger child, Older = older child.

[a]Variances for the younger child actor, and partner variables for all relationships, were not

statistically significant in Model 1a

Table 5

Fit Indices for Nested Models

Model	n	χ^2 (df)	p	CFI	RMSEA (90% CI)	SRMR
1a	221	51.37 (43)	.179	.992	.030 (0.00-.057)	.059
1b	221	78.12 (53)	.014	.976	.046 (0.021-.067)	.079
2a	224	1321.13 (120)	<.001	.961	.047 (0.030-.063)	.082
2b	224	164.87 (122)	.006	.964	.040 (0.022-.054)	.077
3a	224	33.38 (27)	.185	.995	.032 (0.00-.065)	.040
3b	224	57.59 (55)	.379	.998	.015 (0.00-.045)	.044

Note: CFI = Comparative fit index, RMSEA = Root Mean Square Error of Approximation,

CI = Confidence interval, SRMR = Square Root Mean Residual