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Andisheh Vahedi [a,], Isabel Krug [a], Matthew Fuller-Tyszkiewicz [b,c], Elizabeth M Westrupp[b,d]

[a] Melbourne School of Psychological Sciences, The University of Melbourne, VIC 3010 Australia; avahedi@student.unimelb.edu.au; Isabel.krug@unimelb.edu.au

[b] School of Psychology, Deakin University, Geelong, VIC 3220 , Australia

[c] Center for Social and Early Emotional Development, Deakin University, Burwood, VIC 3125, Australia; matthew.fuller-tyszkiewicz@deakin.edu.au

[d] Department of Paediatrics, University of Melbourne, VIC 3010, Australia

* Correspondence to: Andisheh Vahedi, Level 12, Redmond Barry Building, The University of Melbourne, Tin Alley, Parkville VIC 3010; avahedi@student.unimelb.edu.au

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Abstract

Objectives: Recent evidence suggests that parents' negative experiences of combining work and family roles can have harmful effects on children, but little is known about the mechanisms that explain the crossover from the work-family interface to children's mental health over time. This study tested whether inter-parental conflict mediated the relation between maternal work-family factors (conflict or enrichment) and subsequent child mental health problems across childhood (4-5 to 8-9 years) and adolescence (10-11 to 14-15 years). **Methods:** Data were six waves from the kindergarten cohort of the Longitudinal Study of Australian Children, including mother-report of work-family conflict/enrichment and inter-parental conflict, mother- and adolescent-report of internalizing and externalizing problems, and adolescent-report of disordered eating. The final sample consisted of 2158 children and 2181 adolescents. **Results:** Results from structural equation modeling indicated that during childhood, inter-parental conflict partially mediated the relation between maternal work-family conflict and child internalizing problems, but not externalizing problems. During adolescence, there was no evidence for mediation, although work-family conflict was associated with higher adolescent-reported externalizing problems; and inter-parental conflict was also associated with elevated mother-reported internalizing and externalizing problems. Both work-family conflict and enrichment were associated with elevated inter-parental conflict during childhood, but not adolescence. There was no evidence for associations between work-family factors and adolescents' disordered eating, and work-family enrichment was not associated with child or adolescent mental health. **Conclusions:** Intervention programs aimed at reducing both work-family conflict and inter-parental conflict over early childhood are likely to benefit children and families most.

Key words: Work-family conflict, work-family enrichment, inter-parental conflict, internalizing and externalizing problems, disordered eating.

Work-family conflict refers to parents' difficulties in combining work and family roles, and work-family enrichment refers to parents' positive experiences in combining work and family (Greenhaus & Powell, 2006; Marshall & Barnett, 1993); both increasingly common experiences for contemporary parents. Recent studies suggest that work-family factors are associated with child mental health problems (Strazdins, Obrien, Lucas, & Rodgers, 2013; Vieira, Matias, Ferreira, Lopez, & Matos, 2016); however, investigations into the mechanisms that mediate (i.e., explain) these associations over time are scarce (Dinh et al., 2017). Given that inter-parental conflict is related to both work-family conflict/enrichment (Cooklin et al., 2015; Hart & Kelley, 2006), and child mental health problems (Davies & Cummings, 1994; Westrupp, Rose, Nicholson, & Brown, 2015), it is possible that inter-parental conflict may mediate the association between work-family conflict/enrichment and child mental health problems.

Work family conflict is understood in terms of the conservation of resources model, where individuals attempt to preserve precious resources such as time, energy, and money (Hobfoll, 1989); and the work-home interference model (Ten Brummelhuis & Bakker, 2012), where demands in one domain reduce personal resources and consequently obstruct accomplishments in the other domain. Conversely, work-family enrichment is a mechanism through which personal resources accumulate, and improve work and home outcomes (Ten Brummelhuis & Bakker, 2012). Another central concept to work-family theory is spillover. When occurring within an individual, spillover refers to the transfer of experiences from one domain to another, influencing the individual's behaviour in the receiving domain (e.g., work to personal life, affecting individual's mental health) (Bakker & Demerouti, 2012). However, the crossover hypothesis refers to the between-individual transmission of influences to closely related individuals within a household including partner and children (Westman, 2002).

In line with the crossover theory, A growing body of research indicates a positive association between the work-family interface and child behavioral problems (i.e., internalizing and externalizing problems). These associations have been found to operate both directly (Hart & Kelley, 2006; Lawson, Davis, McHale, Hammer, & Buxton, 2014), and indirectly, through a number of family functioning mechanisms, including poor parenting (Dinh et al., 2017; Ferreira et al., 2018), poor parent mental health (Strazdins et al., 2013), poor marital satisfaction (Dinh et al., 2017), and decreases in family cohesion and consistency in daily routines such as eating together, house chores, and bed-time (McLoyd, Toyokawa, & Kaplan, 2008). Work-family enrichment has also been shown to be negatively associated with child behavioral problems both directly and indirectly, through high quality parenting and better parental mental health (Strazdins et al., 2013; Vieira et al., 2016).

The work-family interface has also been investigated in association with eating-related behaviors. Studies have shown that parents' work-family dynamics are associated with less healthy family food environments (Bauer, Hearst, Escoto, Berge, & Neumark-Sztainer, 2012), lower levels of physical activity and higher fatty food consumption in working parents (Allen & Armstrong, 2006; Roos, Sarlio-Lahteenkorva, Lallukka, & Lahelma, 2007), and less encouragement for children to consume healthy food (Bauer et al., 2012). An important untested question however, is whether mothers' work-family experiences influence the pattern for disordered eating symptoms in adolescents. Eating disorder symptoms, including frequent dieting, unhealthy weight control and binge eating are prevalent among adolescents (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011), and many adolescents display subthreshold eating disorder symptoms referred to as disordered eating (Patrick, Stahl, & Sundaram, 2011). While family functioning and conflict in family environments play a role in the development of maladaptive eating behaviors (Latzer, Lavee, & Gal, 2009), it is not known whether mothers' difficulties in juggling work and family put their children at risk of developing disordered eating. It is possible that parents who experience high levels of work-family conflict adopt eating patterns that save more of their time and energy resources (e.g., skipping breakfast or providing pre-made or fast food). Conversely, parents who experience work-family enrichment may have more resources to adopt healthier eating patterns and consequently prevent their children from maladaptive eating behaviors. However, further investigation is needed to test potential links between the work-family interface and disordered eating in adolescents over time.

With a few exceptions (e.g., Dinh et al., 2017; Ferreira et al., 2018), the existing research on the associations between the work-family interface and child behavioral problems used cross-sectional study designs, limiting our understanding in two important ways. Firstly, associations between the work-family interface and child behavioral problems have been investigated separately in childhood or adolescence, but not together, which limits our understanding of developmental effects (for an exception, see Vahedi, Krug, Fuller-Tyszkiewicz, & Westrupp, 2018). The second key limitation in research relates to the lack of appropriate study designs to test indirect effects (i.e., mediation). A fundamental requirement of a true mediation is that the predictor should precede the mediator in time, and the mediator should also precede the outcome variable in time (Cole & Maxwell, 2003), meaning that mediation inferences from cross-sectional data are inappropriate. Therefore, a prospective longitudinal design is needed to investigate the associations between the work-family interface and child behavioral problems and potential linking mechanism.

It is possible that the work-family interface influences child behavioral problems by increasing levels of inter-parental conflict in the home, i.e., defined as frequent verbal arguments, anger, and hostility between

parents (Westrupp et al., 2015). This possibility has theoretical and empirical support. Consistent with the work-home interference model (Ten Brummelhuis & Bakker, 2012), work-family conflict may deplete energy resources leading to higher levels of irritability and conflict between partners. In contrast, work-family enrichment can protect parent resources by enhancing their mood and energy, and therefore reducing conflict between partners. From the emotional security perspective, higher levels of inter-parental conflict may lead to emotionally unpleasant family life, reducing the emotional availability of parents, and threatening the child's mental well-being (Davies & Cummings, 1994). Thus, it is feasible that negative or positive emotions in one family relationship may cross over to other family relationships.

In terms of empirical support, emerging evidence indicates that work-family experiences influence partners' relationship and the level of inter-parental conflict (Cooklin et al., 2015; Dinh et al., 2017); and a large body of research demonstrates the negative impacts of inter-parental conflict on child mental health (e.g., Cummings, George, McCoy, & Davies, 2012). Inter-parental conflict is also one of the family-based environmental factors that may be involved with the development of emotional insecurity and disordered eating in adolescents (George, Fairchild, Cummings, & Davies, 2014). For example, low marital quality has been shown to be associated with poor quality parent-child relationships and higher severity of eating psychopathology (Latzer et al., 2009). However, further investigation is required to test the possibility of inter-parental conflict mediating the association between the work-family interface and child behavioral and eating problems.

In Australia, like many industrialized countries, the rate of maternal employment is increasing. In 2017, 64% of couple families with children reported having both parents in paid work, while a decade ago the proportion was 59% (Australian Bureau of Statistics, 2017). Australian studies indicate that having a young child has greater impacts on the patterns and rates of employment for mothers than fathers (Birch, 2005). Australian mothers typically shoulder a greater share of household and child care responsibilities and problems surrounding work-family balance still disproportionately affect mothers more than fathers (Craig & Sawrikar, 2009). As a result, Australian mothers have found different ways of managing child care responsibilities, including increased use of formal and informal childcare provision, opting to engage in part-time work, working from home, or working flexible hours (Baxter, 2013).

The current study aimed to examine the longitudinal associations between maternal work-family conflict/enrichment and children's behavioral problems via inter-parental conflict. It was hypothesized that work-family conflict/enrichment would have direct and indirect influences on children's and adolescents'

internalizing and externalizing problems, and on adolescents' partial syndromes of bulimia and anorexia through inter-parental conflict. The crossover from work-family conflict/enrichment and inter-parental conflict to children's and adolescents' outcomes were hypothesized to be more salient during childhood than in adolescence.

Method

Participants

Longitudinal Study of Australian Children (LSAC) is a nationally-representative cohort study of Australian children and their families, and includes two cohorts of children: the baby and the kindergarten cohorts. LSAC was approved by the Australian Institute of Family Studies Ethics Committee (Gray & Sanson, 2005). Children were identified using the Australian Medicare health care database and recruited in a two stage process. First, postcodes were selected and then all eligible children within selected postcodes were invited to participate. Full LSAC design and field methods are published elsewhere (Soloff, Lawrence, & Johnstone, 2005). We used data from the Kindergarten cohort across six time-points, comprising 4,983 children who were recruited in 2004 when they were 4-5 years old (Time 1; 59% initial response rate), followed at 6-7 years (Time 2; 90% retention from Time 1), 8-9 years (Time 3; 87% retention from Time 1), 10-11 years (Time 4; 84% retention from Time 1), 12-13 years (Time 5; 79% retention from Time 1), and 14-15 years (Time 6; 71% retention from Time 1).

Two separate datasets were derived, one for childhood (including Times 1-3; $N = 4196$) and one for adolescence (including Times 4-6; $N = 3409$). Mothers were included in each dataset if they were the biological or step/adoptive/foster mothers (childhood dataset, $n = 72$ excluded; adolescence dataset, $n = 123$ excluded). Mothers were excluded from each dataset if they were not employed at baseline (Time1 for childhood dataset, $n = 1648$ excluded; Time 4 for adolescence dataset, $n = 720$ excluded). Single parents were excluded when inter-parental conflict was analyzed in the models, i.e., Times 1 and 2 for childhood sample ($n = 318$ excluded), and Times 4 and 5 for adolescence sample ($n = 385$ excluded). This enabled examination of inter-parental conflict within intact families only, given that the nature of inter-parental conflict is likely to vary substantively (or not be relevant) within single and separated families. The final childhood and adolescence samples were $N = 2158$, and 2181, respectively. The adolescence sample was larger than the childhood sample because there were fewer non-working mothers at Time 4 (23%), compared to Time 1 (43%).

Measures

Work-family conflict/enrichment – assessed at Times 1 and 4. Work-family conflict and enrichment were respectively assessed using a 4-item adaption of the strain scale, and a 6-item adaption of the gain scale developed by Marshal and Barnett (1993). In the strain scale, mothers reported employment-related constraints on family life and parenting, and constraints from family that affect employment. Items were: "Because of my work responsibilities… (1) I have missed out on home or family activities that I would like to have taken part in", (2) "My family time is less enjoyable and more pressured"; "Because of my family responsibilities… (3) I have had to turn down work activities or opportunities that I would prefer to take on", (4) "My work time is less enjoyable and more pressured". In the gain scale, mothers rated the benefits of work on themselves, their parenting and their children. Items were: (1) "My working has positive effect on my child(ren)" (2) "Working helps me to better appreciate the time that I spend with my child(ren)", (3) "The fact that I work makes me a better parent", "Having both work and family responsibilities… (4) Make me a more well-rounded person", (5) "Gives my life more variety", (6) "Makes me feel competent". Items were rated on a five-point scale ranging from 1 "strongly disagree" to 5 "strongly agree". Both scales have been used in recent Australian research and have been shown to be reliable (e.g., αs, for strain scale = .71 and for gain scale = .84) (Dinh et al., 2017; Strazdins et al., 2013). In the current study both scales indicated acceptable internal consistency at Times 1 and 4 (αs, for strain scale = .73 and = .75; for gain scale = .85 and .87, respectively). Work-family conflict and enrichment were estimated as latent variables in the analysis.

Inter-parental conflict – assessed at Times 1, 2, 4, and 5. Verbal inter-parental conflict was assessed by a 4 item adaption of the Inter-Parental Conflict Scale; a subscale of the Co-parental Communication Scale (Australian Institute of Family Studies, 2005). Mothers rated the degree to which they argue with their partner on a five-point scale ranging from never to always. Items were: (1) "How often do you and your partner disagree about basic child-rearing issues?", (2) "How often is your conversation awkward or stressful?", (3) "How often do you argue?", and (4) "How often is there anger or hostility between you?"). This measure has previously been shown to have high reliability (αs = 0.81–0.96) (Ahrons, 1981) and indicated high internal consistency in the current study (αs = .76 - .82). A latent variable was extracted for inter-parental conflict in this study.

Internalizing and externalizing problems – mother-reports at all waves, child-reports at Times 4-6. The Strength and Difficulties Questionnaire (SDQ; Goodman, 1997) consists of five subscales: emotional symptoms, hyperactivity-inattention, conduct problems, peer problems, and prosocial behavior, three of which

were used to assess child internalizing and externalizing problems in this study. The internalizing problems score was formed by summing five items that measured children's emotional symptoms (e.g., "being often unhappy, depressed or tearful). The externalizing problems scale was a sum of ten items in total, with five items assessing conduct problems (e.g., "fighting with other children or bullying them"), and five items contributing to the hyperactivity-inattention scale (e.g., "being restless, overactive, and not staying still for long"). All items were rated on a three-point scale (1 = Not true to 3 = Certainly true). The SDQ has been widely used in both research and practice and it has been shown to have strong psychometric properties in Australian and non-Australian studies (e.g., total difficulties score α = .79) (Stone, Otten, Engels, Vermulst, & Janssens, 2010; Strazdins et al., 2013). In the current study, the internalizing scale showed acceptable internal consistency for mother-reports (αs = .58 - .73), and for child-reports (α = .69 - .75), and the externalizing scale showed acceptable internal consistency for mother-reports (αs = .78 - .81), and for child-reports (αs = .75 - .77). The internalizing and externalizing scores were treated as observed variables in the analysis given that they were derived from well-established, highly reliable, and frequently used scales within the field. This is consistent with common practice and prior research (Bentley et al., 2013). Research on the Australian psychometric properties of the SDQ has shown that items load moderately to strongly onto their predictor factors (Hawes & Dadds, 2004).

Disordered eating – assessed at Time 6 (adolescence-report). The Branched Eating Disorder Test (BEDT; Selzer, Hamill, Bowes, & Patton, 1996) is designed to assess partial syndromes of bulimia and anorexia nervosa based on DSM-IV criteria (American Psychiatric Association, 2000) in teenaged community samples. A partial syndrome of anorexia was defined as meeting two of the DSM-IV criteria for anorexia: (e.g., low body weight, defined on the basis of a *z* score for body mass index (BMI) below the 5th percentile for age and gender. Example item: "How long have you been having days without eating?"). A partial syndrome of bulimia was defined as meeting two of the DSM-IV criteria for bulimia (e.g., objective bingeing at least weekly for at least 4 weeks. Example item: "Over the last 4 weeks have you taken any tablets, medicines or drugs in order to control your weight?"). Definitions of partial syndromes of anorexia and bulimia have high agreement with the Eating Disorders Examination in community sample of schoolgirls in Australia (sensitivity 1.0, specificity 0.99, positive predictive value 0.7) (Patton, Coffey, Carlin, Sanci, & Sawyer, 2008). Items were coded to create a binary composite score, where "yes" or "no" responses represented having or not having partial anorexia or bulimia nervosa symptoms, and therefore they were treated as observed as opposed to latent variables. The bulimia and anorexia composites showed acceptable internal consistency (αs = .69 and .78, respectively).

Eating behaviors – assessed at Time 4. Two items of the Feeling Questionnaire were used to assess mothers' feelings about their children's eating behaviors on a three-point scale (0 = No, 1 = A little, 2 = Yes; items were "Do you have any concerns at the moment that (1) the child eats too little?, (2) the child eats too much or eats unhealthy food?). This questionnaire was developed for LSAC and has not been used previously. Given that childhood eating behaviors have been found to be risk factors for subsequent disordered eating symptoms (Kotler, Cohen, Davies, Pine, & Walsh, 2001), these two items were used as early controls for disordered eating variables in this study.

Sociodemographic characteristics. Mothers reported on a range of child and family demographic characteristics including child age, child gender, number of children in the household, child indigenous status, main language spoken at home, mothers' age, working hours, and their own level of education. Socio-economic position was a continuous, composite variable, which was formed based on household (i.e., both parents if available) income, education and occupational prestige and was divided into quartiles at baseline using the population weights and full sample.

Data Analyses

Variables were cleaned and derived in Stata version 13.1 (StataCorp, 2013). An autoregressive structural equation modeling approach was employed to examine the proposed mediation paths longitudinally (see conceptual diagram in Figure 1). This method ensures the principle of temporality in a true mediation, that is the independent variable occurs before the mediator, and that the mediator occurs before the dependent variable (Jose, 2016). Study models were analyzed in Mplus version 7.4 (Muthén & Muthén, 1998–2015) via structural equation modeling (Figure 1). The independent variables (i.e., work-family conflict and work-family enrichment) and the mediator (i.e., inter-parental conflict) were treated as latent variables to reduce potential bias related to measurement error that may lead to false inferences about the nature of the mediation (Bedeian, Day, & Kelloway, 1997). The outcome variables (i.e., internalizing and externalizing problems) were treated as observed variables.

Three models were tested separately: one childhood model and two adolescence models. The childhood model investigated the associations between mother-reported work-family conflict and enrichment at 4-5 years, inter-parental conflict at 6-7 years, and child internalizing and externalizing problems at 8-9 years. The first adolescence model tested the associations between mother-reported work-family conflict and enrichment at 10-11 years, inter-parental conflict at 12-13 years, and child internalizing and externalizing problems at 14-15

years. The second adolescence model tested the same associations with child-reported internalizing and externalizing problems and disordered eating problems as additional outcome variables.

The analysis was conducted via multiple steps. In step 1, confirmatory factor analysis (CFA) was conducted to establish separate measurement models for inter-parental conflict, work-family conflict and enrichment. Modifications indices suggested an error covariance be added between inter-parental conflict items 1 and 2 across all waves, which resulted in good fit. This modification was thought to be relevant given that both items focused on the same domain, i.e., having disagreements and awkward conversations. The error covariance between items 1 and 2 was added for work-family conflict in line with previous research (Westrupp et al., 2016). For work-family enrichment, error covariances between items 1 and 2, and items 5 and 6, were added to the CFA model. These adjustments were thought to be meaningful because the first two items were focused on the influences of work on children, and the last two items were focused on the impact of work on the parent.

In step 2, longitudinal measurement invariance (i.e., stability over time) was tested for the repeated measures of inter-parental conflict for childhood (Times 1 and 2) and adolescence (Times 4 and 5) models. Inter-parental conflict measured during childhood achieved full metric invariance (i.e., the item loadings were consistent across waves), and partial scalar invariance (i.e., at Time 1, intercepts for items 3 and 4, and at Time 2 intercept for item 1 were freely estimated). Inter-parental conflict measured during adolescence achieved full metric invariance. Fit indices for the measurement invariance models are presented in Supplementary Table 1.

In step 3, the full structural models were specified as per Figure 1. Models were specified to account for the covariances between residuals for each of the endogenous variables measured within the same wave. Work-family factors and inter-parental conflict at baseline were regressed onto the control variables (i.e., child gender, number of children in the household, mothers' working hours and socio-economic position). Child mental health outcomes were regressed onto child gender and socio-economic position. Prior levels of the dependent and the mediator variables were also included as controls. Given that disordered eating variables were only available at Time 6, two items assessing eating behaviors at Time 4 were substituted as early controls for eating disorders. The childhood model was weighted using cross-sectional weights from Time 1, and the adolescence models were weighted using cross-sectional weights from Time 4 to account for non-response.

Both childhood and adolescence datasets comprised missing data on the independent and mediator variables (i.e., up to 16% at one time-point for work-family conflict and enrichment; up to 20% for inter-parental conflict). The default method in Mplus, maximum likelihood estimation was used to estimate models

using all available data under the assumption that data were missing at random, where missingness was a function of observed covariates and outcomes. In the second adolescence model, a robust weighted least squares (WLSMV) estimator was used for the categorical dependent variables of partial anorexia and partial bulimia, where missingness can be a function of the observed covariates. To analyze the associations in each of the three models, firstly, direct associations were modelled and Mplus stratification and cluster options were applied to account for the complex survey design of LSAC. Secondly, the Mplus INDIRECT command was used and the bias-corrected bootstrap with replicate weights was requested, to improve the performance of confidence limits for the indirect associations (MacKinnon, Lockwood, & Williams, 2004).

Both the *p*-values and the bias corrected confidence intervals from the bootstrapped results are reported to determine the significance levels. However, greater weight was given to interpreting the confidence intervals given that these data provide information about a range in which true values lie with a certain probability, as well as the direction and strength of the effects (MacKinnon et al., 2004). Accordingly, when confidence intervals do not include zero, the mediating effect can be interpreted as statistically significant. Regarding fit indices, given that chi-square is less informative with large sample sizes (Byrne, 2013), other fit indices are also reported: root-mean-square error of approximation (RMSEA) which is an absolute measure of fit and values <.06 indicate good fit, the standardized root mean square residual (SRMR) with values <.05 indicating good fit, the comparative fit index (CFI) which is less sensitive to sample size with values >.90 indicating acceptable fit, and values >.95 indicating good fit (Hu & Bentler, 1999). Standardized estimates are also reported for the purpose of comparison between models.

Results

Preliminary analysis

Characteristics of the included and excluded participants in the final childhood and adolescence samples are presented in Supplementary Table 2. Mothers' average working hours per week were 23.74 hours (*SD* = 14.58) at Time 1 and 27.58 hours (*SD* = 13.57) at Time 4. Given that only employed mothers were included, the included families tended to be more socioeconomically advantaged than the excluded families. Half of the children included in both the childhood and adolescence datasets were male, and neither average age nor gender distribution differed significantly from the excluded participants. Means, standard deviations, and correlations between model variables are presented in Supplementary Tables 3-5. Correlations between variables were small but in the expected direction.

Childhood Model

The model depicted in Figure 2 includes mother-reported child outcomes. This model indicated good fit; χ^2 (294, N = 2158) = 1063.99, p < .001; RMSEA = .03, 90% CI [.033, .037]; CFI = .949; SRMR = .04. Results indicated that work-family conflict at Time 1 predicted higher mother-reported internalizing problems in children at Time 3 and this association was partially mediated by inter-parental conflict at Time 2; total effect = .02, p = .03, 95% CI [.01, .12]; total indirect = .003, p = .06, 95% CI [.001, .02], two-tailed. There were no direct or indirect associations between work-family conflict at Time 1 and child externalizing problems at Time 3. Work-family enrichment was not directly or indirectly associated with internalizing and externalizing problems in children. However, work-family enrichment was associated with elevated inter-parental conflict over time.

Adolescence Models

The model depicted in Figure 3 includes mother-reported adolescent outcomes. This model indicated acceptable fit, χ^2 (293, N = 2181) =1269.71, p < .001; RMSEA = .04, 90% CI [.037, .04]; CFI = .944; SRMR = .04. Results indicated that maternal work-family conflict and enrichment at Time 4 were not associated with inter-parental conflict at Time 5, or mother-reported internalizing and externalizing problems in adolescents at Time 6. However, inter-parental conflict at Time 5 was associated with higher mother-reported internalizing and externalizing problems in adolescents at Time 6.

The model depicted in Figure 4 includes adolescent-reported outcomes. This model showed acceptable fit; χ^2 (375, N = 2181) = 1173.68, p < .001; RMSEA = .03, 90% CI [.029, .033]; CFI = .92. Similar to Figure 3, there was no evidence for mediation. However, there was a direct association between maternal work-family conflict at Time 4 and adolescent-reported externalizing problems at Time 6 (total effect = .05, p = .01, 95% CI [.003, .10], two tailed). Inter-parental conflict was not associated with adolescent-reported internalizing and externalizing problems. Work-family conflict/enrichment and inter-parental conflict were not associated with partial syndromes of bulimia and anorexia nervosa. Similarly, there was no evident association between work-family enrichment and adolescents' mental health.

Discussion

Using a nationally representative sample of Australian children spanning ages 4-5 years through to 14-15 years and their employed mothers, we investigated the mediating role of inter-parental conflict in the associations between mothers' experiences of work-family conflict and enrichment and their children's mental health outcomes over two developmental stages: childhood and adolescence. During childhood, we found that

inter-parental conflict partially mediated the association between maternal work-family conflict and mother-report of child internalizing problems. There was no mediation evident during adolescence, but there was evidence that work-family conflict was directly associated with adolescent-reported externalizing problems. Across all three models, there was no evidence that work-family enrichment was related to child internalizing or externalizing problems. Disordered eating variables were not related to work-family variables or inter-parental conflict.

The aim of the study was to test the mediating role of inter-parental conflict in the association between work-family conflict or enrichment and child internalizing and externalizing problems during childhood and adolescence, and adolescent disordered eating symptoms. The proposed mediation model was partially supported. Our results showed that inter-parental conflict partially mediated the association between maternal work-family conflict and internalizing problems during childhood; and that work-family conflict was longitudinally associated with internalizing problems during childhood and externalizing problems during adolescence. These associations remained despite inclusion of a range of sociodemographic variables and after controlling for pre-existing internalizing and externalizing problems and inter-parental conflict. Our study provides further support for the crossover theory by showing that difficulties in combining work and family responsibilities consequently cross over to the couple relationship and also to children (Westman, 2002).

Our findings suggest that children continue to be influenced by their mothers' experiences of work-family conflict from early childhood, and right through to middle adolescence. This is congruent with previous findings indicating that parental workloads and high levels of stress remain fairly consistent regardless of child age (Craig & Sawrikar, 2009) and adds to the findings by Westrupp et al. (2016) which indicated stability in maternal work-family conflict over childhood. We add to the current literature by providing evidence that maternal work-family conflict at 4-5 years and 10-11 years of age predict subsequent behavioral problems in children four years later. Thus, interventions designed at reducing work-family conflict should be inclusive for all families; reducing work-family conflict and inter-parental conflict may well be equally important for improving both child and adolescent behavioral problems.

Despite the longitudinal influences of work-family conflict across childhood and adolescence, mediation through inter-parental conflict was only evident during childhood. Thus, work-family conflict influenced children via two distinct paths. In childhood, this influence operated both directly and indirectly through inter-parental conflict. In adolescence, the influence operated only directly. It is possible that adolescents are less influenced by the conflicts in the home environment, as they spend less time with their

parents and relatively more time with their peers as they progress through adolescent years (Collins et al., 2002). Further, it may be that work-family conflict has more immediate (i.e., shorter-term) consequences on inter-parental conflict than the two-year time intervals employed in this study. Alternatively, our measure of inter-parental conflict may be too stable over time, lacking in sensitivity for detecting small changes, and thus reducing our ability to detect mediation. This possibility is supported by the rank-order stability of inter-parental conflict found (i.e., inter-parental conflict at Time 1 predicting inter-parental conflict at Time 2 = .54, inter-parental conflict at Time 4 predicting inter-parental conflict at Time 5 = .98). Finally, our study only investigated one direction of association between the variables; the real direction of associations over time may have been best understood in the reverse or a different order, or associations may be mutually-influencing over time (i.e., reciprocal).

We also found that the association between maternal work-family conflict and adolescents' externalizing problems was only evident when adolescents reported on their own mental health, as opposed to when mothers reported on adolescents' mental health. This may be explained by the variations in the behavior across different contexts, where adolescents may exhibit more externalizing behaviors outside the home environment which may be less observed by their mothers. In contrast, direct influences of inter-parental conflict on adolescents' internalizing and externalizing problems were only evident when mothers reported on their adolescents' mental health. Given the lack of longitudinal studies in this field, replication is needed to clarify discrepancies between multiple informants.

Our findings add to those of previous cross-sectional studies (e.g., Strazdins et al., 2013; Vieira et al., 2016), which found that parents' mental health and negative parent-child interactions mediated the association between work-family conflict and child mental health difficulties. In contrast to the findings by Strazdins et al. (2013) and Vieira et al. (2016), which indicated a protective role for work-family enrichment against child internalizing and externalizing problems, our findings did not provide evidence of a positive influence of work-family enrichment on child internalizing and externalizing problems. It may be that the positive influence of work-family enrichment is not strong enough to mitigate the risks posed by work-family conflict, or perhaps work-family enrichment poses only short-term positive influences compared to more enduring effects of work-family conflict. In light of our findings, interventions focused mainly on reducing work-family conflict rather than increasing enrichment may have greater benefits.

In addition, we found that both work-family conflict and enrichment were associated with increased inter-parental conflict during childhood, but not during adolescence. It is possible that work-family enrichment

is associated with career advancements which can increase the work responsibilities and pressure. Although these experiences may still be experienced as positive and enhancing, they may result in higher conflict between couples during early childhood, given that early childhood is the time that work-family conflict and care demands are highest (Bianchi & Milkie, 2010).

No evidence was found for the association between work-family factors and disordered eating variables. There are possible explanations for this finding. Despite our use of a large representative sample, only a very small number of adolescents who reported on their disordered eating were identified as having a partial syndrome of bulimia (2.2%) and a partial syndrome of anorexia (0.23%). These frequencies are lower than previous Australian studies reporting on the prevalence of partial-syndromal eating disorders in 1943 Victorian adolescents (i.e., 6.4% for bulimic symptoms and 3.8% for anorexic symptoms) (Patton et al., 2008). Nevertheless, studies using similar measures have reported similar prevalence rates for eating problems (mean point prevalence for partial eating disorders = 2.4%), which indicates that these are generally low prevalence problems (Patton, Coffey, & Sawyer, 2003). It is possible that the associations between the work-family interface, inter-parental conflict and disordered eating do not generalize well to a non-clinical population. Thus, testing these associations in the population-based sample of LSAC may have overshadowed the associations that may otherwise exist in a clinical sample.

Our findings provide greater insight into the sustained influences of maternal work-family conflict on child behavioral problems over the ten years from kindergarten to adolescence, and suggest both work-family conflict and inter-parental conflict as two potential levers for intervention. In the context of findings of the current and previous Australian studies (Strazdins et al., 2013; Vieira et al., 2016), maternal work-family conflict can be understood as a factor influencing within-family interactions, with subsequent influences on child mental health. Given that Australian mothers have the bulk of caregiving responsibility and high rates of work-family conflict, our findings are likely to be relevant to other western cultures where mothers are juggling work and family roles. Our findings are consistent with the extant literature and advocate for family-friendly work environments (see Kelly et al., 2014). For example, interventions designed to promote employees' control over the timing, the number of hours and location of their work, and training supervisors to provide personal and performance support to the employees can be used to reduce the amount of work-family conflict (Kelly et al., 2014). Indeed, research has shown that workplace interventions designed to reduce work-family conflict and promote a supportive working environment can enhance adolescents' mental well-being (Lawson et al., 2016). We suggest that promoting close family relationships may also provide benefits for families who experience

work-family conflict. Perhaps, adding emotionally focused couple therapy to the wok-family interventions can provide benefits for families and their children.

Strengths and Limitations

The current study had notable strengths, which enabled us to address the theoretical and methodological gaps in prior research. The large sample size and rich dataset of LSAC, with multiple repeated measures, allowed examination of associations longitudinally. The use of structural equation modeling enabled mediation to be tested within a single step, and allowed comparison of direct and indirect associations to assist in interpreting the sequence of longitudinal associations (Cole & Maxwell, 2003). The use of multiple informants in adolescence models offered valuable assessment data given that discrepancies between multiple informant reports often arise from true variations in the assessed behavior across different contexts (De Los Reyes, Thomas, Goodman, & Kundey, 2013). Finally, the use of two separate datasets enabled inclusion of mothers who were re-entering the workforce at different time-points.

Caution should be taken in generalizing the findings of the current study. Firstly, the nature of employment may be different in other developed or developing countries. Secondly, findings can only be generalized to working mothers who are in a couple relationship, not single parents. Thirdly, we acknowledge limitations in regards to measurement. The inter-parental conflict measure used in the current study only assessed frequency of conflicts, when other dimensions including children's exposure to the conflict (Hart & Kelley, 2006) tend to be more predictive of adjustment problems. Further, non-invariance of intercepts for inter-parental conflict during adolescence may be indicative of measurement bias, and may be suggestive of other factors that influenced the participants to respond differently to items across waves (Guenole & Brown, 2014). We also acknowledge that despite SDQ being a highly reliable measure within the field, low internal consistency of the internalizing and externalizing scales in our study necessitates replication of the findings using other measures.

It should also be noted that the effect sizes were small. However, it is difficult to detect longitudinal mediation in social sciences, as they are based on the product of residualized coefficients (Jose, 2016), and can be affected by great measurement intervals (Timmons & Preacher, 2015). Therefore, even small longitudinal indirect associations may be worthy of recognition. Moreover, this study relied only on mothers' reports of work-family conflict and enrichment and inter-parental conflict. It is suggested for future research to include both mothers' and fathers' work-family experiences and consequences on family functioning. Finally, child-reported mental health outcomes were not available during childhood. Therefore, it was not possible to compare

mother-reported and child-reported outcomes during childhood, which may have resulted in shared method variance biasing the results.

Conflict of Interest

The authors declare that they have no conflict of interest.

Author Contributions

AV: designed and executed the study, completed the data analyses, and wrote the paper. IK: collaborated with the design and writing of the study. MF: contributed to the statistical analyses and writing of the results. EW: collaborated.

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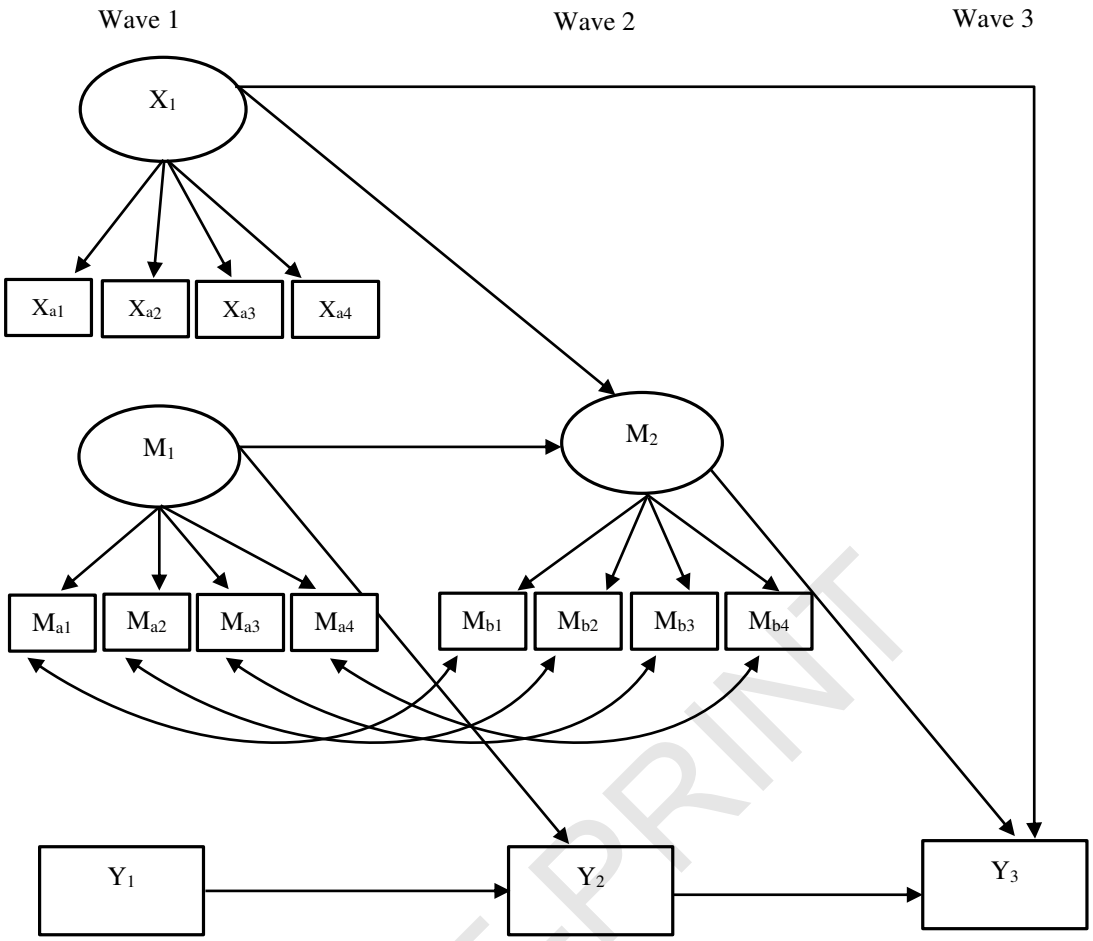

Figure 1. Conceptual three-wave autoregressive mediation model with a latent predictor (X), a latent mediator (M), and an observed outcome variable (Y). Note that the figure is illustrative only, given that it shows one independent and one dependent variable, whereas our models have multiple of each. Models were run separately for childhood and adolescence, and each model included three waves of data.

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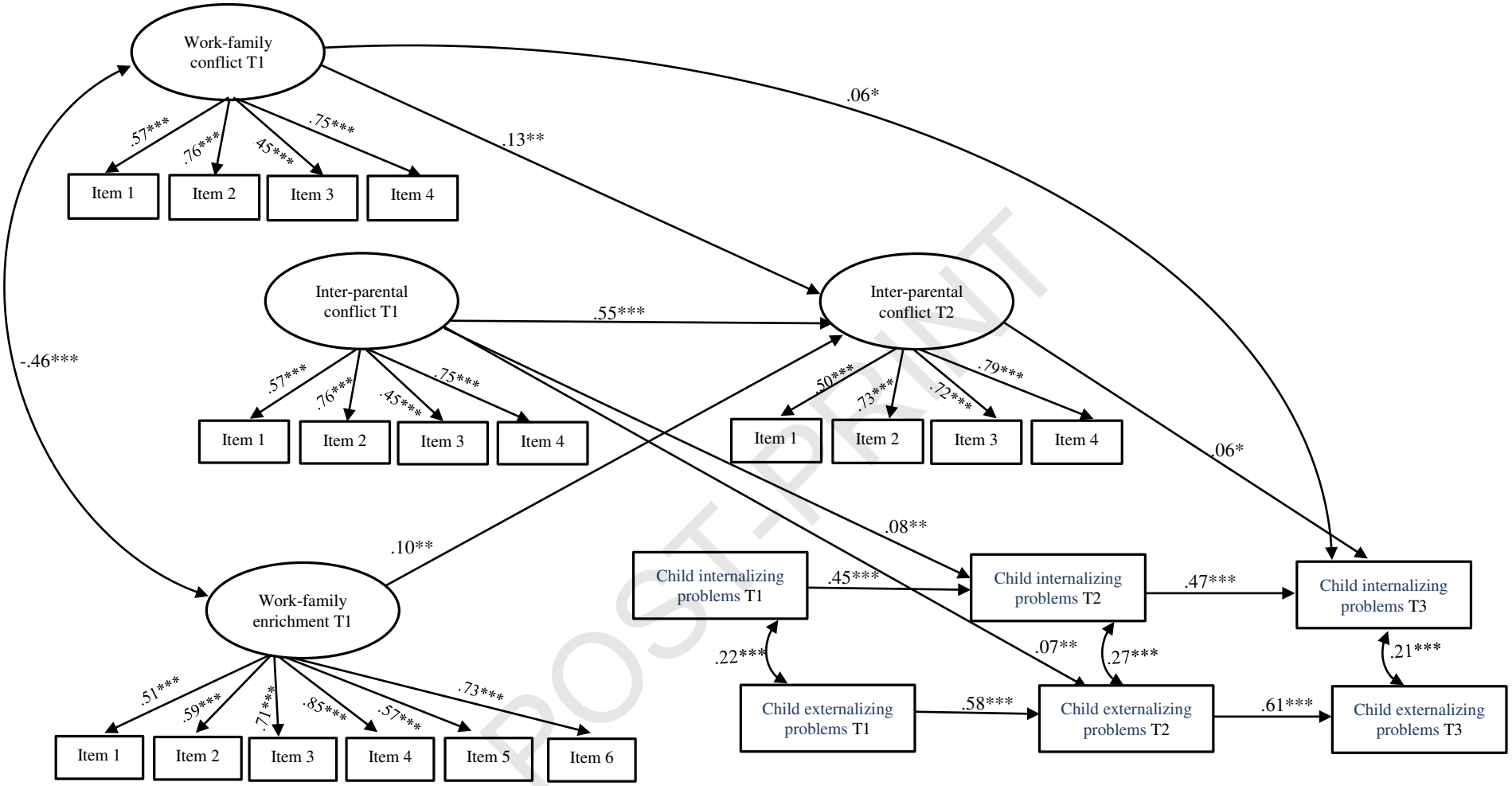

***Figure* 2**. Findings from autoregressive mediation model showing direct and indirect paths between study variables during childhood (mother-reported child outcomes). Figures are standardized regression coefficients. Non-significant paths are not depicted, but remained in the model. $N = 2158$, *$p < .05$. ** $p < .01$. *** $p < .001$. T1 = 4-5 years, T2 = 6-7 years, T3 = 8-9 years.

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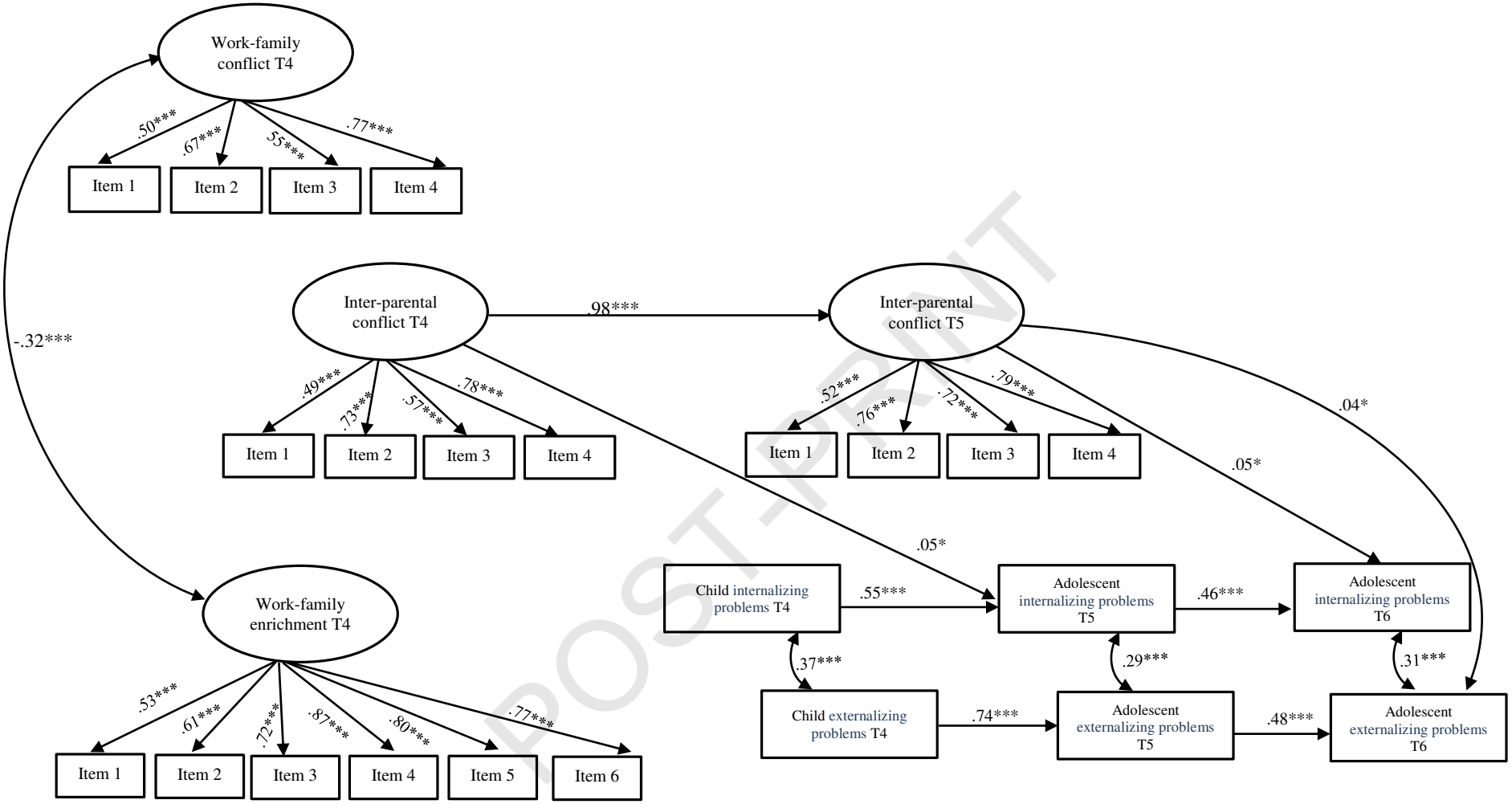

***Figure* 3**. Findings from autoregressive mediation model showing direct and indirect paths between study variables during adolescence (mother-reported adolescent outcomes). Figures are standardized regression coefficients. Model was adjusted for child gender, number of children in the household, socio-economic position, and mothers' working hours which are not depicted. Non-significant paths are not depicted, but remained in the model. $N = 2181$, *p <.05. ** p <.01. *** p <.001. T4 = 10-11 years, T5 = 12-13 years, T6= 14-15 years.

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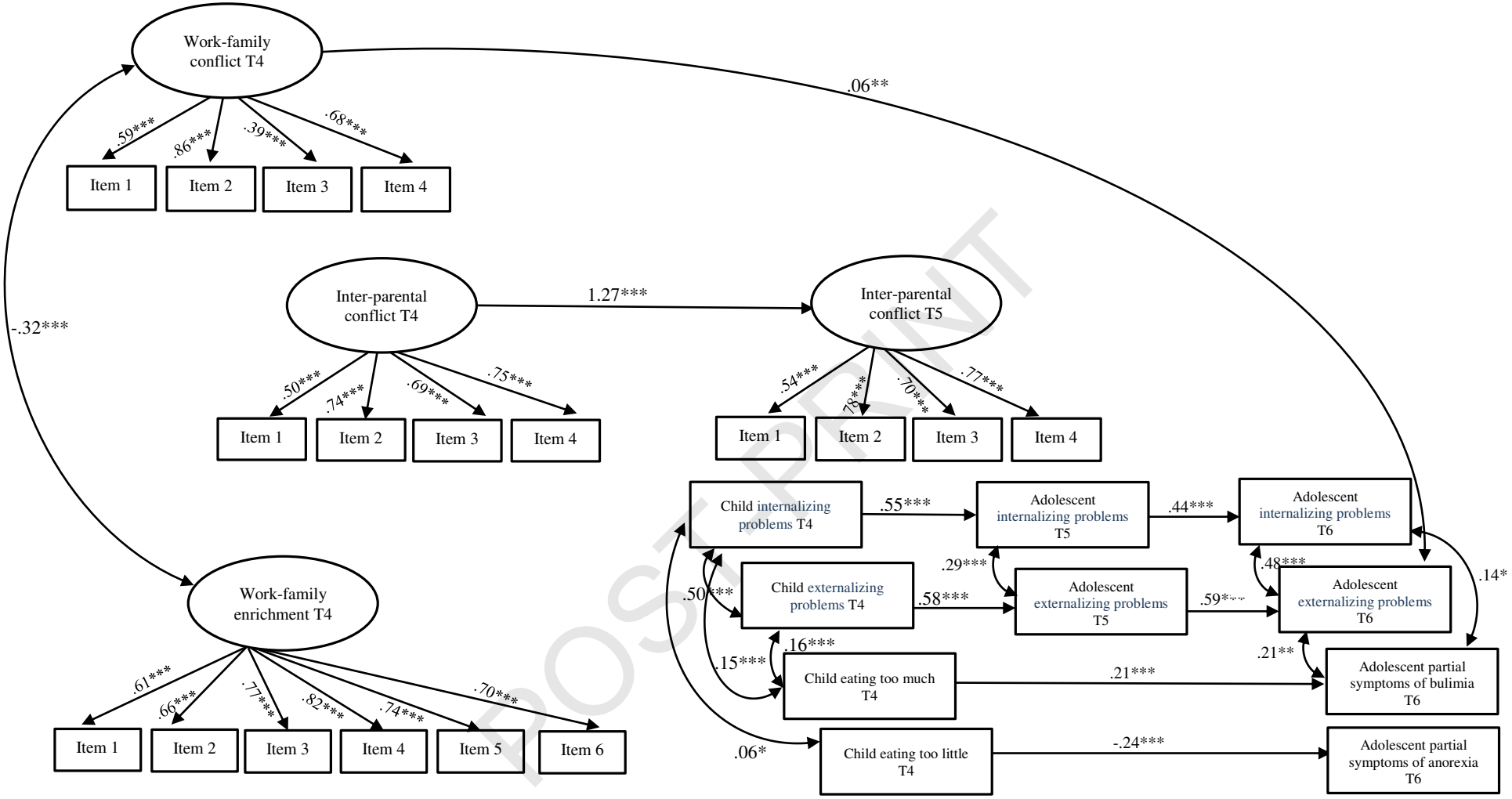

***Figure* 4**. Findings from autoregressive mediation model showing direct and indirect paths between study variables during adolescence (adolescent-reported outcomes). Figures are standardized regression coefficients. Model was adjusted for child gender, number of children in the household, socio-economic position, and mothers' working hours which are not depicted. Non-significant paths are not depicted, but remained in the model. $N = 2181$, *$p < .05$. ** $p < .01$. *** $p < .001$. T4 = 10-11 years, T5 = 12-13 years, T6= 14-15 years.

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Supplementary Table 1

Model Fit Indices for Measurement Models

Measurement models for inter-parental conflict	x^2 (*df*, *p*)	RMSEA	CFI	SRMR
Childhood model, Waves 1-2				
Configural invariance	247.23 (7, <.001)	.13	.95	.03
Full metric invariance	91.83 (16, <.001)	.05	.99	.03
Partial scalar invariance	207.41 (18, <.001)	.07	.96	.04
Adolescence model, Waves 4-5				
Configural invariance	208.37 (7, <.001)	.05	.97	.04
Full metric invariance	63.96 (16, <.001)	.04	.99	.02

Note. Childhood model $N = 2158$; adolescence model $N = 2181$.

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Supplementary Table 2

Sample Characteristics at T1 and T4 and Differences between Included and Excluded Participants

Variable	Time-point	Included participants, %	Excluded participants, %	χ^2 (φ)
Child male	T1	49.81	52.50	3.03 (-.03)
	T4	50.39	50.81	0.05 (-.004)
Child age in months, mean (*SD*)	T1	56.96 (2.59)	56.83 (2.66)	16.14 (.06)
	T4	129.77 (3.53)	129.92 (3.51)	18.64 (.07)
Mother age in years, mean (*SD*)	T1	35.50 (4.74)	34.27 (5.52)	146.36*** (.18)
	T4	41.62 (4.49)	40.85 (6.01)	154.40 *** (.21)
Low Socio-economic position	T1	7.88	29.24	258.78*** (.28)
	T4	8.59	29.87	252.31*** (.27)
Mother education below year 12	T1	31.49	47.46	100.64*** (.17)
	T4	30.12	47.46	96.09*** (.17)
Having two or more children	T1	89.81	88.47	1.93 (-.02)
	T4	93.12	89.40	14.44*** (-.06)
Main language not English	T1	11.72	16.73	21.63*** (-.07)
	T4	11.69	18.32	28.55*** (-.09)
Aboriginal/ Torres Strait Islander	T1	1.76	4.12	20.65*** (.07)
	T4	1.51	3.42	13.29*** (.06)

Note. *SD* = Standard deviation. T1 = 4-5 years old, T4 = 10-11 years old. ***$p < .001$. Childhood dataset: excluded $N = 2038$, included $N = 2158$; adolescence dataset: excluded $N = 2228$, included $N = 2181$.

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Supplementary Table 3

Means, Standard Errors and Correlations between Variables in Childhood Model

Variable	*M*	*S.E*	1	2	3	4	5	6	7	8	9
1. Maternal work-family conflict (T1)	0.51	0.12	1.00								
2. Maternal work-family enrichment (T1)	0.15	0.07	-0.42***	1.00							
3. Inter-parental conflict (T1)	-0.77	0.07	0.29***	-0.17***	1.00						
4. Inter-parental conflict (T2)	-7.15	1.05	0.24***	-0.05	0.75***	1.00					
5. Mother-reported internalizing (T1)	0.31	0.01	0.14***	-0.11***	0.15***	0.09***	1.00				
6. Mother-reported internalizing (T2)	0.29	0.01	0.09***	-0.06***	0.14***	0.12***	0.46***	1.00			
7. Mother-reported internalizing (T3)	0.28	0.01	0.13***	-0.06*	0.15***	0.15***	0.38***	0.55***	1.00		
8. Mother-reported externalizing (T1)	1.11	0.02	0.11***	-0.12***	0.18***	0.10***	0.23***	0.11***	0.10***	1.00	
9. Mother-reported externalizing (T2)	0.91	0.02	0.09***	-0.08***	0.19***	0.16***	0.15***	0.24***	0.15***	0.62***	1.00
10. Mother-reported externalizing (T3)	0.86	0.02	0.09**	-0.06*	0.17***	0.15***	0.13***	0.16***	0.22***	0.53***	0.72***

Note. $N = 2158$. *M* = mean; *S.E* = standard error. T1 = 4-5 years old, T2 = 6-7 years old, T3 = 8-9 years old. $^{**}p < .01$. $^{***}p < .001$. (two-tailed).

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Supplementary Table 4

Means, Standard Errors and Correlations between Variables in Adolescence Model (Figure 3)

Variable	*M*	*S.E*	1	2	3	4	5	6	7	8	9
1. Maternal work-family conflict (T4)	0.49	0.10	1.00								
2. Maternal work-family enrichment (T4)	0.17	0.06	-0.28***	1.00							
3. Inter-parental conflict (T4)	-0.04	0.14	0.33***	-0.09***	1.00						
4. Inter-parental conflict (T5)	-0.01	0.15	0.24***	-0.03	0.80***	1.00					
5. Mother-reported internalizing (T4)	0.35	0.01	0.16***	-0.08***	0.13***	0.11***	1.00				
6. Mother-reported internalizing (T5)	0.36	0.01	0.10***	-0.05***	0.12***	0.13***	0.56***	1.00			
7. Mother-reported internalizing (T6)	0.36	0.01	0.13***	-0.04	0.13***	0.14***	0.50***	0.60***	1.00		
8. Mother-reported externalizing (T4)	0.85	0.01	0.14***	-0.05	0.19***	0.18***	0.35***	0.21***	0.16***	1.00	
9. Mother-reported externalizing (T5)	0.75	0.02	0.11***	-0.04*	0.16***	0.18***	0.26***	0.31***	0.19***	0.76***	1.00
10. Mother-reported externalizing (T6)	0.69	0.02	0.12***	-0.05*	0.18***	0.19***	0.23***	0.22***	0.30***	0.68***	0.73***

Note. $N = 2181$. *M* = mean; *S.E* = standard error. T4 = 10-11 years old, T5 = 12-13 years old, T6 = 14-15 years old.*$p < .05$. **$p < .01$. ***$p < .001$. (two-tailed).

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Supplementary Table 5

Means, Standard Errors and Correlations between Variables in Adolescence Model (Figure 4)

Variable	*M*	*S.E*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Maternal work-family conflict (T4)	0.55	0.11	1.00												
2. Maternal work-family enrichment (T4)	0.20	0.08	-0.35***	1.00											
3. Inter-parental conflict (T4)	-0.07	0.13	0.32***	-0.12***	1.00										
4. Inter-parental conflict (T5)	-0.20	0.15	0.24***	-0.05*	0.80***	1.00									
5. Self- reported internalizing (T4)	0.57	0.01	0.08**	-0.05	-0.01	-0.01	1.00								
6. Self- reported internalizing (T5)	0.48	0.01	0.04*	-0.03*	-0.001	-0.01	0.56***	1.00							
7. Self- reported internalizing (T6)	0.57	0.01	0.05*	-0.03***	-0.004	-0.01	0.36***	0.53***	1.00						
8. Self-reported externalizing (T4)	1.08	0.02	0.09**	-0.03	0.07**	0.06**	0.50***	0.25***	0.11***	1.00					
9. Self-reported externalizing (T5)	0.98	0.02	0.05**	-0.03	0.07***	0.07**	0.30***	0.45***	0.21***	0.59***	1.00				
10. Self-reported externalizing (T6)	0.96	0.02	0.10***	-0.04***	0.07**	0.07**	0.24***	0.31***	0.44***	0.46***	0.65***	1.00			
11. Mother-reported eating too much (T4)	0.47	0.02	0.004	-0.002	0.11	0.03	0.03***	0.02***	0.05***	0.07***	0.10***	0.08***	1.00		
12. Mother reported eating too little (T4)	0.17	0.03	0.01	0.01	0.07	0.02	0.01*	0.01*	0.02	0.01	0.03	0.02	0.02	1.00	
13. Self-reported bulimia (T6)	0.57	0.26	-0.09	0.02	0.04	0.02	0.03	0.01***	0.16**	-0.01	0.002	0.16**	0.13***	-0.02	1.00
14. Self-reported anorexia (T6)	0.54	0.54	-0.04	-0.01	-0.06	-0.03	-0.03	0.02*	0.32**	-0.04	-0.02	0.18	0.08	-0.12***	0.23**

Note. $N = 2181$. *M* = mean; *S.E* = Standard error. T4 = 10-11 years old, T5 = 12-13 years old, T6 = 14-15 years old.*$p < .05$. **$p < .01$. ***$p < .001$. (two-tailed).