



# Pandemic-Related Disruption and Positive Adaptation: Profiles of Family Function at the Onset of the Pandemic

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## Abstract

The onset of the pandemic brought heightened stress to parents due to disruptions to family life, in addition to processes of positive family adaptation, including greater closeness, more time spent together, and shared problem-solving. Delineating how early pandemic-related family stress and positive adaptation simultaneously operate is important for understanding risk and resilience. We use a person-oriented approach to identify subgroups of caregivers based on patterns of stress and positive adaptation in the first months of the pandemic. Data come from a multi-national study of 549 caregivers (68% female) of 1098 children (younger child:  $M = 9.62$ ,  $SD = 3.21$ ; older child:  $M = 11.80$ ,  $SD = 3.32$ ). In May 2020, caregivers reported on stress (income, family, and pandemic-specific) and positive adaptation using previously validated scales, and covariates indexing family vulnerabilities (i.e., caregiver adverse childhood experiences, caregiver and child mental health) and psychosocial resources (caregiver social support, positive coping, religiosity/spirituality, and benevolent childhood experiences, and pre-pandemic socioeconomic resources). A latent profile analysis was conducted using the four indicators. Profiles were examined in relation to covariates using BCH procedures. A 4-profile solution was selected, characterized by Low Disruption ( $n = 296$ ), Multi-Domain Disruption ( $n = 36$ ), Income Disruption ( $n = 111$ ), and Family Disruption ( $n = 106$ ) groups. Positive adaptation minimally differentiated profiles. Participants in the Low Disruption group reported more resources and fewer vulnerabilities than other groups. Those in the Multi-Domain Disruption group reported the fewest resources and the most vulnerabilities. Early in the pandemic, a minority group of individuals in this sample carried a disproportionate burden of pandemic-related stress. Potential consequences to family functioning and implications for systemic family prevention and intervention efforts are discussed.

**Keywords** Stress · Adversity · Positive adaptation · Person-oriented · Pandemic

When the pandemic and associated restrictions emerged in early 2020, life disruptions were ubiquitous. Adults from across the globe experienced an influx of stressors related to fears of the virus, uncertainty about public health guidelines, cancelled plans/opportunities, changes to personal care routines, social isolation, and financial insecurity (Alzueta et al., 2021; Cooke et al., 2020; Park et al., 2020; Varma

et al., 2021). However, stressors were not distributed equally, with rates of infection, hospitalization, and mortality, as well as economic hardship and other pandemic-related disruptions, varying across demographic groups (Abrams & Szefler, 2020; Gozzi et al., 2021). The current study examines patterns of pandemic-related family disruption and positive adaptation amongst caregivers using a person-oriented approach to identify the nature and correlates of family functioning at the onset of the pandemic. We focus on caregivers of school-aged children, as they have experienced elevated levels of pandemic-related stress and its sequelae as compared to adults without children (Gadermann et al., 2021; Park et al., 2020; Pierce et al., 2020; Wamser-Nanney et al., 2021). This is a critical undertaking given the global burden of mental illness (Vigo et al., 2016), as well as the role of caregivers' psychological functioning in children's responses to adversity (Chemtob et al., 2010).

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## Pandemic-Related Disruption in Families with Young Children

The daily impact of the pandemic on the lives of parents and their children has been described as a sledgehammer (Eales et al., 2021). In addition to challenges broadly experienced by the adult population, parents have been tasked with managing changing family rules and routines, work and childcare tensions, fluctuating stay-at-home orders and childcare/school closures, homeschooling, crowding and family alterations, and decisions related to the health and vaccination of their dependent children. The challenges parents have contended with generally fall into one of three categories: (i) financial disruption (e.g., job insecurity, income loss); (ii) relational (e.g., child management, family conflict); and (iii) pandemic-specific stress (e.g., overwhelm due to exposure to the news, difficulty accessing essential supplies; Prime et al., 2021). In the first domain, a national survey of US parents conducted early in the pandemic revealed significant financial disruptions related to insurance status, food insecurity, and use of food banks (Patrick et al., 2020). Families with pre-existing hardship have been most impacted by financial and food insecurity brought on by the pandemic (Martin et al., 2022), highlighting the differential impact of recessions across demographic characteristics (e.g., race, gender, and class status; Biu et al., 2021). In the relational domains, following the initial lockdown, families implemented over a dozen new rules on average (Bülow et al., 2021), and both parents and adolescents reported a decline in their relationships (less warm and supportive) relative to pre-pandemic levels (Donker et al., 2021). Moreover, pandemic disruption seeped into family systems by way of altering co-parental cooperation and family cohesion (Browne et al., 2021; Peltz et al., 2021). Finally, in the pandemic-specific realm of disruption, caregivers reported heightened strain and commotion or *chaos* in their families (Cassinat et al., 2021), increased health-related anxiety (e.g., fears about the health of themselves or their loved ones or exposure to COVID-19; Peltz et al., 2021), challenges accessing usual healthcare and supplies/food, and overwhelm due to the consumption of news/media related to COVID-19 and digital emotion contagion (Golding et al., 2021; Offord Centre for Child Studies, 2020; Prikhidko et al., 2020).

## Positive Adaptation Amidst Exposure to Adversity

Families are dynamic and complex systems that, during times of severe or prolonged adversity, are tasked with adapting in ways that bring them closer together, support

joint problem-solving, and foster meaning-making and hope (Masten & Motti-Stefanidi, 2020). In this way, families can serve as islands of strength in the presence of stress and uncertainty (Walsh, 2015). Though most research has examined negative changes to the lives of families amid the pandemic, there are also processes of positive adaptation at play. For instance, in one study of changes to family relationships since the start of the pandemic, most youth reported either little change or improvement in the quality of their relationships with their parents and siblings (Martin-Storey et al., 2021). Relatedly, in a mixed-methods study wherein parents responded to open-ended questions, a prominent theme of gratitude related to spending more unstructured and enjoyable time as a family emerged (Eales et al., 2021). There were reports of closeness and connection, coping, enhanced teamwork, and problem-solving despite, or because of, pandemic-related challenges. As noted above, however, these positive changes have not been universal. Indeed, some families have reported positive effects of the pandemic (e.g., increases in parental autonomy support and family support; decreases in parental behavioral control and family conflict), whereas others have reported negative effects (Bülow et al., 2021; Rogers et al., 2021). Conflicting findings across studies could be indicative of processes that are sample specific (in terms of geography, risk, or pandemic period), or may be the result of researchers seeking to uncover *either* processes of risk or adaptation. Consideration of processes of both disruption and positive adaptation, simultaneously, will provide a nuanced and comprehensive picture of changes to family systems amid the pandemic.

## Considering Family Functioning from a Person-Centered Perspective

Studies of family disruption and positive adaptation have typically used variable-centered approaches which examine relations between variables. Variable-centered analyses assume and treat individuals within a sample as belonging to a homogenous group, wherein predictors operate similarly on outcomes for an entire sample. This is helpful for understanding the relative importance of predictor variables (e.g., financial stress) in explaining variance in outcomes (e.g., caregiver distress; Laursen & Hoff, 2006). However, using such an approach obfuscates unique and specific patterns of functioning within individuals—for instance, those who are experiencing some pandemic-related stressors but not others, or those who are experiencing pandemic stress in tandem with positive adaptation. In contrast, a person-oriented approach provides a “holistic and interactionistic perspective of the

individual...” (von Eye & Bergman, 2003, pg. 553), by identifying subgroups of participants based on their similarities to one another on attributes or relations amongst attributes (i.e., profiles). Applied to the current context, a person-oriented approach will allow for the identification of unique subgroups of individuals based on patterns of family disruption and positive adaptation, which can be examined in relation to other family vulnerabilities (e.g., pre-existing adversity or current mental health) and psychosocial resources (e.g., positive coping, social support, religiosity/spirituality, or socioeconomic resources). Identifying heterogeneous subgroups and their correlates is important given the differential impact of the pandemic on certain individuals, for instance women, individuals from marginalized or racialized groups, and those with existing economic hardship and housing instability (Benfer et al., 2021; Condon et al., 2020; Connor et al., 2020; Wamser-Nanney et al., 2021). This endeavor can inform current and future pandemic recovery efforts.

## Current Study

The current study uses a person-oriented approach to examine profiles of family disruption and positive adaptation amongst caregivers of children ages 5 to 18 in the first months of the pandemic. We address the following research questions:

1. Can we identify profiles of COVID-related family function based on pandemic-related stressors (i.e., income, family life, and pandemic-specific factors) and positive adaptation?
2. Are there profile differences in other family vulnerabilities (i.e., caregivers’ own childhood adversity, and the concurrent mental health of children and caregivers) and psychosocial resources (i.e., caregivers’ own positive childhood experiences, positive coping, social support, religiosity/spirituality, and pre-existing socioeconomic resources)?

To address these questions, we use a Latent Profile Analysis (LPA) to determine the number of profiles necessary to explain differences in the observed pandemic response patterns in areas of income, family, and pandemic-specific stress, as well as positive family adaptation, while taking parsimony into consideration (Geiser, 2012). Furthermore, we examine mean differences in covariates (i.e., vulnerabilities and resources) across profiles (Asparouhov & Muthén, 2014; Bakk & Vermunt, 2016) to help characterize profiles.

## Materials and Methods

### Participants and Procedure

Data come from the Child Resilience and Managing Pandemic Emotional Distress in Families Study (CRAMPED), with the current hypotheses and data analysis preregistered [Open Science Framework Registration <https://doi.org/10.17605/OSF.IO/7MNXG>]. Ethics approval was obtained from the research ethics boards of the universities of all listed authors. Caregivers with *at least* two children between 5 and 18 years of age were recruited through the Prolific® research panel to address broader questions related to between- and within- family processes operating during the COVID-19 pandemic. Participants were surveyed six times from May 2020 to January 2022 (May, July, September, and November 2020; September 2021; and January 2022). The current study includes data from the first wave only (May 2020), as measurement related to pandemic-related disruption and positive adaptation was only collected at this time point. All data is based on caregiver reports.

Participants included 549 caregivers (68% were female) reporting on two children ages 5–18 years old (1098 children). Younger children had a mean age of 9.62 years ( $SD = 3.21$ ) and older children had a mean age of 11.80 years ( $SD = 3.32$ ). Most families (45.5%) had two children living in the home (range = 1 to 8). Participants came from the UK (76%), the USA (19%), Canada (4%), and Australia (1%). Most were married (90%), full-time workers (52%), and White-European (73%). Household income in 2019 ranged from < \$15,000 to \$175,000+ USD (median = \$50,000 to \$74,999 USD; IQR = \$25,000 to \$99,999 USD). Most caregivers had at least some post-secondary education (69%).

## Measures

### COVID-Related Family Functioning

Four indicators were included in the LPA, taken from two scales developed by the author team. Items were generated by senior author (DT) and members of their laboratory at the University of Waterloo. Item development aligned with conceptual frameworks of family risk and resilience during times of adversity (Masten & Narayan, 2012; Walsh, 2015), including during the pandemic (Prime et al., 2020). In addition, emerging accounts of pandemic-related stress from scientific and popular media reports were integrated, given the swift mobilization required to initiate data

collection in May 2020. The final set of items included 25 items covering the content areas of pandemic-related stressors and 14 items related to positive family adaptation. Item reduction and scale development is described in original papers (Prime et al., 2021; Shoychet et al., 2022) and elaborated below. Caregivers were asked to respond to the prompt “Since the COVID-19 disruption, have any of the following changes occurred in your household?”, and rate each item on a 3-point Likert scale of *Not True* [1], *Somewhat True* [2], and *Very True* [3].

**COVID-19 Family Stressor Scale** As detailed in a previous report, the 25-item pool was reduced to 16 items captured by three factors via an exploratory factor analysis (Prime et al., 2021). The three factors represented stressors characterized by financial stress (5 items; e.g., significant decrease in income; financial debt; job disruption; government assistance), family stress (7 items; e.g., family altercations, emotional withdrawal, difficulties with child management; partner conflict), and pandemic-specific stress (4 items; e.g., difficulties accessing essential supplies, stressed by crowded public spaces, anxiety about danger to self/loved ones). The three subscales demonstrated strong measurement invariance across female and male caregivers, had adequate internal consistency (Income Stress,  $\alpha = 0.75$ ; Family Stress,  $\alpha = 0.82$ ; and Pandemic-Specific Stress,  $\alpha = 0.68$ ), and significant correlations with related caregiver (i.e., mental health symptoms, parenting stress), family (i.e., couples’ functioning and parenting practices), and child constructs (i.e., mental health symptoms) in the small to large range. The three subscales identified in Prime et al. (2021) were used in the current LPA as indicators of family stressors amid the pandemic (scale items can be found in Supplemental File 1 Table S1).

**Family Positive Adaptation During COVID-19 Scale** As detailed in a previous report, the 14-item pool was reduced to 7 items captured by one factor via an exploratory factor analysis, characterized by family cohesion, flexibility, routines, and meaning-making since the start of the pandemic (Shoychet et al., 2022). The one-factor model demonstrated strong measurement invariance across female and male caregivers and had adequate internal consistency ( $\omega = 0.65$ ). The scale had small and significant bivariate correlations with caregiver positive coping, parenting practices, couple satisfaction, and family functioning, but not negatively valenced constructs (i.e., caregiver mental health symptoms and harsh parenting). This scale was used in the current LPA as an indicator of positive family adaptation amid the pandemic (scale items can be found in Supplemental File 1 Table S2).

## Covariates

### Family Vulnerabilities

**Caregiver Adverse Childhood Experiences (ACEs)** Caregivers’ history of adversity was measured using the ACEs revised scale (Finkelhor et al., 2015). Caregivers endorsed 14 items related to childhood maltreatment and family dysfunction (e.g., childhood abuse, neglect, peer victimization, exposure to community violence, and socioeconomic status) as either *Present* [1] or *Absent* [0]. Items were summed into an ACEs index (range 0 to 14;  $M = 2.75$ ,  $SD = 3.15$ ).

**Caregiver Mental Health** Caregiver anxiety was assessed using the 4-item anxiety measure of the Patient-Reported Outcomes Measurement Information System (PROMIS®; Pilkonis et al., 2011). Caregivers reported on the frequency of experiencing feelings of fear, worry, and anxiety in the past seven days, with responses ranging from *Never* [1] to *Always* [5]. Caregivers also reported on their *psychological distress* using the Kessler Psychological Distress Scale (Kessler et al., 2002), a 10-item scale assessing the frequency of feelings related to depression and anxiety as experienced in the past 30 days, with response options ranging from *None of the time* [1] to *All of the time* [5]. Scales were computed based on a summation of items, with higher scores indicating more caregiver anxiety (range 4 to 20;  $M = 7.77$ ,  $SD = 3.65$ ) and psychological distress (range 10 to 49;  $M = 20.12$ ,  $SD = 7.93$ ), respectively.

**Child Mental Health** Caregivers reported on children’s mental health problems using the parent proxy reports of the PROMIS® (PROMIS Health Organization, 2021). The following domains were administered (v2.0): anger (5-items), anxiety (8-items), and depressive symptoms (6-items). Caregivers reported the frequency of difficulties in each domain on a 5-point Likert scale ranging from *Never* [1] to *Almost Always* [5]. Items were summed to compute a total score, with higher scores indicating greater mental health problems (younger child: range 19 to 80;  $M = 32.95$ ,  $SD = 11.34$ ; older child: range 19 to 81;  $M = 33.84$ ,  $SD = 12.40$ ).

### Caregiver Psychosocial Resources

**Benevolent Childhood Experiences (BCEs)** Seven items from the BCEs scale were used to assess caregivers’ childhood experiences with safe adults, friends, and beliefs, endorsed as *Present* [1] or *Absent* [0] (Narayan et al., 2018). Items were summed into a BCEs index (range 0 to 7;  $M = 5.66$ ,  $SD = 1.58$ ), with higher scores representing more experiences of benevolence prior to the age of 18 years old.

**Socioeconomic Resources** Caregivers reported on 2019 annual household income to capture financial resources prior to any disruption due to the pandemic, ranging from *Less than \$15,000* [1] to *\$175,000+* [9]. Household income did not account for number of persons in the home. In addition, caregiver education level was reported categorically, and treated as a continuous variable, ranging from *No Formal Qualifications* [0] to *PhD* [6]. Each of household income and caregiver education was z-scored and they were combined into a composite, with higher levels representing more pre-existing socioeconomic resources.

**Positive Coping** The Connor-Davidson Resilience Scale consists of 10 items measuring caregivers' own positive stress coping ability in domains of hardiness, social support/purpose, faith, and persistence (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003). This is distinct from the Family Positive Adaptation During COVID-19 Scale, which reflects family-level positive adaptation as it relates to the pandemic, specifically. Caregivers rated items on a scale of *Not At All True* [0] to *True Nearly All The Time* [4]. Items were summed into a total score, with higher scores reflecting more positive coping (range 6 to 40;  $M = 28.43$ ,  $SD = 6.69$ ).

**Social Support** Caregivers reported on six items related to feelings of safety, trust, closeness, and helpfulness of close others, taken from the National Longitudinal Study of Children and Youth (Statistics Canada, 2017). They rated items on a scale of *Strongly Disagree* [1] to *Strongly Agree* [4]. Items were summed into a total score, with higher scores representing more perceived social support (range 8 to 24;  $M = 20.41$ ,  $SD = 3.48$ ).

**Religiosity** Religious and spiritual beliefs and practices were assessed using select items from the Brief Multidimensional Measure of Religiousness/Spirituality (Masters et al., 2009). Caregivers reported on religious/spiritual beliefs (nine items; e.g., connection to and/or love for God; sense of calling) on a scale of *Strongly Disagree* [1] to *Strongly Agree* [5] and religious/spiritual practices (four items; e.g., praying, meditating) on a scale of *Never* [1] to *Every Day* [5]. Items were summed into a total score, with higher scores representing more religiosity/spirituality (range 13 to 65,  $M = 31.17$ ,  $SD = 14.18$ ).

## Data Analytic Plan

Analyses were conducted in two steps using MPlus version 8. First, an LPA was used to identify profiles of family disruption and positive adaptation, followed by an automated BCH procedure to evaluate mean differences in covariates across profiles. First, the four indicators (three stressors

and one positive adaptation) were subjected to LPA using an MLR estimator. Scale scores were used rather than item-level data to reduce complexity and increase model convergence (Ferguson et al., 2020). Six solutions were sequentially evaluated to identify model fit and interpretability, as five to six models are typically sufficient for finding the best-fitting model both theoretically and statistically (Tein et al., 2013). Model selection considered model fit and conceptual clarity, based on guidelines from Ferguson et al. (2020), including consideration of the loglikelihood, Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), and Sample-Adjusted BIC (SABIC) values, wherein lower values represent the preferred model. In addition, entropy was considered to reflect how well each LPA model partitioned the data into profiles, ranging from 0 to 1 (values  $\geq 0.80$  are indicative of minimal uncertainty of profile classification; Celeux & Soromenho, 1996). Finally, the Lo-Mendell-Rubin (LMR-LRT) and Bootstrap Likelihood Ratio Test (BLRT) were used to compare a current model to a model with  $k - 1$  profiles, with a non-significant  $p$ -value indicating that the  $k - 1$  model is preferred. Two additional considerations were made when selecting a final model. First, profiles with  $\geq 5\%$  of the sample were considered the minimum appropriate size. Second, conceptual clarity, wherein patterns and profiles are interpretable, was necessary in selecting a final model. The retained model was interpreted by examining patterns of the included indicators (i.e., means and standard deviations) within and between profiles. Profiles were labelled based on observed differences in indicators using caution to interpret based on the relative relation between profiles in the sample and the absolute magnitude of described profiles (Ferguson et al., 2020). We did not formally assess mean differences between profiles on individual indicators. The LPA demonstrates that profiles are statistically distinct while considering the indicators dependently. Investigating mean differences would increase the probability of type 1 error in performing multiple additional tests without providing additional information.

Next, we used the automated BCH procedure to evaluate mean differences in family vulnerabilities and caregiver psychosocial resources across profiles. To do this, we specified the measurement model for the latent class variable and then independently estimated the mean of the covariates across the different classes with the BCH method using the MLR estimator (Asparouhov & Muthén, 2014).

## Results

Descriptive statistics (means and SDs) and a correlation matrix of all study variables, including indicators and covariates, can be found in Table 1. After sequentially evaluating six models (1 to 6 profiles; see Table 2), Model

**Table 1** Descriptive statistics and correlation matrix of study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	SD
1. Income Stress	1													1.49	0.49
2. Family Stress	0.27**	1												1.53	0.45
3. Pandemic Stress	0.34**	0.50**	1											1.87	0.51
4. Positive Adaptation	0.15**	0.15**	0.24**	1										1.80	0.38
5. ACES	0.22**	0.27**	0.31**	0.05	1									2.75	3.15
6. Caregiver Distress	0.24**	0.52**	0.47**	-0.02	0.33**	1								20.12	7.93
7. Caregiver Anxiety	0.23**	0.46**	0.49**	0.04	0.27**	0.79**	1							7.77	3.65
8. YC Mental Health	0.18**	0.36**	0.26**	0.07	0.17**	0.37**	0.33**	1						32.95	11.34
9. OC Mental Health	0.10*	0.32**	0.25**	0.06	0.22**	0.42**	0.37**	0.50**	1					33.84	12.40
10. BCEs	-0.07	-0.10*	-0.14**	0.14**	-0.43**	-0.26**	-0.17**	-0.06	-0.09*	1				5.66	1.58
11. Social Support	-0.15**	-0.31**	-0.14**	0.14**	-0.28**	-0.36**	-0.26**	-0.19**	-0.23**	0.26**	1			20.41	3.48
12. Positive Coping	-0.12**	-0.17**	-0.15**	0.23**	-0.11*	-0.45**	-0.40**	-0.24**	-0.16**	0.19**	0.28**	1		28.43	6.69
13. Religiosity/Spirituality	0.10*	-0.01	0.04	0.29**	0.01	-0.07	-0.01	0.002	-0.03	0.19**	-0.001	0.19**	1	31.17	14.18

\*\* , correlation is significant at the 0.01 level (2-tailed); \* , correlation is significant at the 0.05 level (2-tailed)

**Table 2** LPA model fit summary with unstandardized means

Model	Log likelihood	AIC	BIC	SABIC	Entropy	Smallest class %	LMR p-value	LMR meaning	BLRT p-value	BLRT meaning
1	-1388.823	2793.646	2828.111	2802.716	-	-	-	-	-	-
2	-1248.19	2522.38	2578.385	2537.118	0.755	29.5	<0.00001	2 > 1	<0.00001	2 > 1
3	-1218.657	2473.314	2550.86	2493.72	0.779	14.9	0.2717	3 < 2	<0.00001	3 > 2
4	<b>-1164.772</b>	<b>2375.544</b>	<b>2474.63</b>	<b>2401.618</b>	<b>0.819</b>	<b>6.5</b>	<b>0.0011</b>	<b>4 &gt; 3</b>	<b>&lt;0.00001</b>	<b>4 &gt; 3</b>
5	-1145.853	2347.707	2468.334	2379.45	0.818	7.3	0.5041	5 < 4	<0.00001	5 > 4
6	-1122.568	2311.136	2453.303	2348.548	0.839	4.4	0.2455	6 < 4	<0.00001	6 > 4

Optimal solution (four profiles) in bold

4 provided the best fit to the data, as it had a low loglikelihood, AIC, BIC, and SABIC values, high entropy value, significant LMR/BLRT *p*-values (4 vs. 3 profiles), and a nonsignificant LMR *p*-value (5 vs. 4 profiles). Moreover, the smallest profile contained more than 5% of the sample, and there was conceptual clarity of the profiles. The BLRT comparing 5 to 4 profiles was significant, providing some evidence that the 5-profile solution offered a better fit than the 4-profile solution. To address this, log-likelihood values were plotted; a bend in the plot following the 4-profile model indicated diminishing model improvement relative to the additional parameters estimated (Supplemental File 1 Figure S1; Masyn, 2013). Given this, and for parsimony, the 4-profile solution was selected.

Next, we examined the pattern of means and standard deviations of indicators of the selected 4-profile solution (Table 3). As shown in Fig. 1, the differences between the four latent groups were largely due to differences in income, family, and pandemic-specific disruption rather than positive adaptation (which minimally differentiated the profiles). Furthermore, within profiles, there was a pattern of elevated pandemic-specific stressors (e.g., anxiety about

danger to self/loved ones, stress due to crowded public spaces, overwhelm by pandemic-related news), compared to one or more other indicators. Unique characteristics of the profiles were as follows: Profile 1 (‘Low Disruption’ group), characterized by low levels of stress across domains; Profile 2 (‘Multi-Domain Disruption’ group), characterized by relatively high levels of stress across domains; Profile 3 (‘Income Disruption’ group), characterized primarily by high levels of income-related stress; and Profile 4 (‘Family Disruption’ group), characterized primarily by high levels of family-related stress.

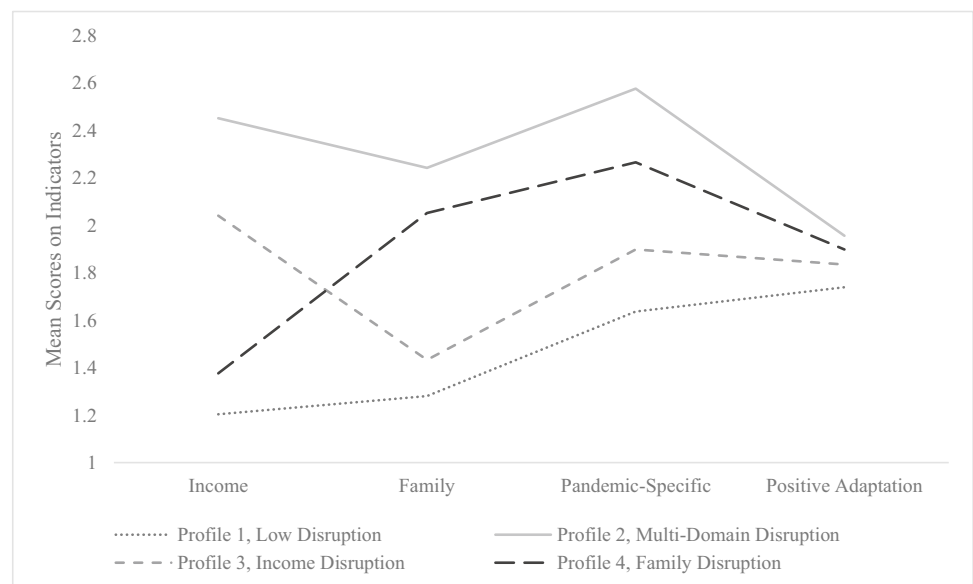
The results of the automated BCH procedures highlight pairwise differences in covariates (family vulnerabilities and caregiver psychosocial resources). Mean scores of covariates across profiles are plotted in Fig. 2 and can be found in tabular form in Supplemental File 1 Table S3. The Low Disruption group was characterized by having higher levels of social support compared to all other groups, higher positive coping compared to the Multi-Domain Disruption and Family Disruption groups, and higher pre-pandemic socioeconomic resources compared to the Multi-Domain Disruption and Income Disruption groups. In addition, the Low

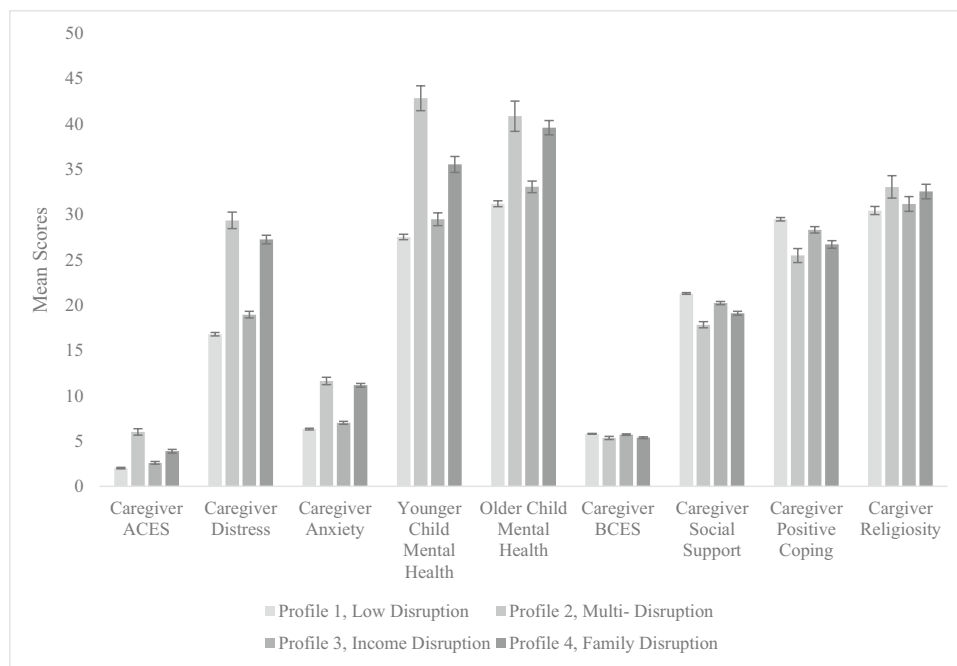
**Table 3** Four-profile model results

	Profile 1, Low Disruption ( <i>n</i> = 296)	Profile 2, Multi-Domain Disruption ( <i>n</i> = 36)	Profile 3, Income Disruption ( <i>n</i> = 111)	Profile 4, Family Disruption ( <i>n</i> = 106)
Income	1.204 (0.067)	2.452 (0.067)	2.041 (0.067)	1.377 (0.067)
Family	1.281 (0.084)	2.243 (0.084)	1.433 (0.084)	2.053 (0.084)
Pandemic-Specific	1.637 (0.170)	2.577 (0.170)	1.899 (0.170)	2.266 (0.170)
Positive Adaptation	1.74 (0.140)	1.957 (0.140)	1.835 (0.140)	1.899 (0.140)

Means and standard deviations of variables used to create the profiles; standard deviations are the same as they are constrained in Mplus

**Fig. 1** Comparison of profiles on indicator variables. Line graph comparing profiles on indicator variables using mean scores. Mean scores are on a scale of Not True [1], Somewhat True [2], and Very True [3]. Profile 1: *n* = 296; Profile 2: *n* = 36; Profile 3: *n* = 111; Profile 4: *n* = 106





**Fig. 2** Comparison of profiles on covariate variable means. All variables are measured at Wave 1 (May, 2020). Socioeconomic resources not plotted due to different scaling (standardized scores). Profile 1:  $n=296$ ; Profile 2:  $n=36$ ; Profile 3:  $n=111$ ; Profile 4:  $n=106$ . Pairwise comparisons ( $* p<0.05$ ;  $** p<0.01$ ;  $*** p<0.001$ ): Caregiver ACES: Class 2 > 1 $^{***}$  3 $^{***}$  4 $^*$ ; Class 4 > 1 $^{***}$  3 $^*$ . Caregiver Distress: Class 2 > 1 $^{***}$  3 $^{***}$ ; Class 4 > 1 $^{***}$  3 $^{***}$ ; Class 3 > 1 $^*$ . Caregiver Anxiety: Class 2 > 1 $^{***}$  3 $^{***}$ ; Class 4 > 1 $^{***}$  3 $^{***}$ . Younger Child Mental

Health: Class 2 > 1 $^{***}$  3 $^{***}$  4 $^*$ ; Class 4 > 1 $^{***}$  3 $^{**}$ . Older Child Mental Health: Class 2 > 1 $^{**}$  3 $^*$ ; Class 4 > 1 $^{***}$  3 $^{**}$ . Caregiver BCES: Not interpreted as overall chi-square test non-significant. Caregiver Social Support: Class 1 > 2 $^{***}$  3 $^*$  4 $^{***}$ ; Class 3 > 2 $^{**}$ . Caregiver Positive Coping: Class 1 > 2 $^*$  4 $^{**}$ . Socioeconomic Resources: Class 1 > 2 $^*$  3 $^{***}$ . Religiosity/Spirituality: Not interpreted as overall chi-square test non-significant

Disruption group reported fewer ACEs compared to Multi-Domain and Family Disruption groups, lower levels of caregiver anxiety and child mental health challenges compared to the Multi-Domain and Family Disruption groups, and lower caregiver distress compared to all other groups. Furthermore, the Income Disruption group reported fewer ACEs and lower levels of caregiver anxiety/distress and child mental health challenges than the Multi-Domain Disruption and Family Disruption groups, and more social support than the Multi-Domain Disruption group. Finally, the Family Disruption group reported fewer ACEs and, for younger children only, lower levels of child mental health symptoms than the Multi-Domain Disruption group. Pairwise comparisons on caregiver religiosity and BCEs were not examined as the overall chi-square tests were non-significant.

## Discussion

The current study identified unique subgroups of caregivers based on their reported patterns of financial, family, and pandemic-specific stress, and positive adaptation, during the first wave of the COVID-19 pandemic in May 2020. In addition, profiles were examined in relation to covariates

characterizing family vulnerabilities and caregiver psychosocial resources to assist with profile interpretation. A 4-profile model of family disruption and positive adaptation offered the best fit to the data, which included a Low Disruption group that comprised over half the sample (54%), a high disruption group (Multi-Domain Disruption; 7%), and two additional profiles each representing about one fifth of the sample (Income Disruption and Family Disruption, respectively). Levels of positive adaptation did not clearly differentiate the profiles. Overall, those least impacted by pandemic-related disruption (Low Disruption group) reported more caregiver psychosocial resources and fewer family vulnerabilities than groups with other patterns of pandemic-related disruption. In contrast, those who experienced the most pervasive pandemic-related disruption (Multi-Domain Disruption group) reported the fewest psychosocial resources and the most family vulnerabilities. Notably, the Multi-Domain Disruption group reported more caregiver ACEs and child mental health difficulties compared to all other groups. These findings highlight the differential impact of the pandemic on caregivers of school-age children, wherein negative experiences of the pandemic and its restrictions appear to cluster within a relatively small group of individuals.



Many participants belonged to the Low Disruption group. This group, like all others, reported elevated pandemic-specific disruption—that is, their daily lives were impacted by the pandemic restrictions, fears related to being in public, and/or the danger the virus posed to their own health and that of their loved ones. Notably, however, pandemic-specific stress within the Low Disruption group was lower than all other groups (note that we did not formally test mean differences). Furthermore, this disruption to their daily lives was not accompanied by significant income-related stressors (e.g., job loss/insecurity, worries about providing for their family) nor tensions related to increased family altercations or household crowding. Finally, the Low Disruption group reported, on average, some positive adaptation (mean score on the positive adaptation scale of 1.74 ( $SD = 0.14$ )—that is, benefits emanating from the pandemic such as new routines, greater meaning-making, and more flexibility in their daily lives. This pattern of findings of relatively low family stress and some benefits is in line with other studies that have found most participants report little change, or even improvements, to their family circumstances amid the pandemic (Bülow et al., 2021; Martin-Storey et al., 2021; Rogers et al., 2021). In addition, this Low Disruption group was characterized by having more pre-pandemic socioeconomic resources, higher levels of concurrent social support and positive coping, fewer mental health problems, and less childhood adversity, together suggesting that this is an overall low-risk group. We suspect that this group of families is unlikely to be significantly negatively impacted over the course of the pandemic and is likely to bounce back in the new normal.

In contrast, a small but significant segment of our sample reported moderate to high disruption across domains of income, family, and pandemic-specific stress (Multi-Disruption group; approximately 7%). These are families who are experiencing high levels of daily disruptions due to the pandemic, have tenuous financial resources to provide for their families (made worse by the pandemic), and are managing significant levels of family dysfunction. Individuals experiencing multiple pandemic-related stressors are considered high-risk, validated by the pattern of covariates which revealed elevated caregiver and younger child mental health difficulties and more caregiver childhood adversity, as well as fewer resources to promote resilience in the face of stress (e.g., positive coping, social support, and pre-pandemic socioeconomic resources). These findings align with a study involving a sample of service workers in a large US city, wherein a minority of the sample experienced all four COVID-related hardships surveyed (i.e., job loss, income loss, caregiver burden, and household illness), and were concurrently reporting the worst parent and child psychological well-being (Gassman-Pines et al., 2020). Furthermore, findings are consistent with evidence of vulnerability pathways

during COVID-19, wherein pre-existing psychosocial vulnerabilities serve as risk factors for COVID-19 disruption and its consequences in families (Rizeq et al., 2021).

There is emerging longitudinal evidence of the sequelae that follow high levels of pandemic-related disruption. For instance, families experiencing higher levels of pandemic-related distress have greater difficulties confiding in one another, finding closeness, and problem-solving, which in turn is related to increasing levels of caregiver distress and child mental health difficulties over the course of the pandemic (Browne et al., 2021). This effect cuts both ways, wherein child mental health difficulties also antedate later caregiver distress, family dysfunction, and parent–child negativity (Browne et al., 2021; Essler et al., 2021). As such, the small subgroup of families making up the Multi-Disruption group is of grave concern in terms of risk for negative and reciprocal transactions within the family system over time, which may persist well beyond the pandemic (Wade et al., 2021a). For these families, the pandemic itself may serve as a mechanism of continued intergenerational stress and trauma, without targeted efforts to (i) mitigate the social disruption caused by pandemic restrictions (e.g., school closures, lockdowns); (ii) prevent against the negative effects of pandemic stress on caregivers and family systems; and/or (iii) intervene to help caregivers, families, and children cope with negative emotions and interaction patterns, and build capacity for family resilience (Walsh, 2015). Currently, targeted systemic family interventions to help the highest risk families recover from the pandemic are critically important as we move through, and eventually out of, the pandemic (Carr, 2019).

The final two groups identified in the current study comprised about 40% of the sample, with both characterized by elevated pandemic-specific stress (i.e., daily disruptions due to the pandemic), but differences with respect to the other stressors they were managing. Specifically, one group was primarily strained by financial and/or job insecurity, whereas the other was strained primarily by elevated family dysfunction. Distinguishing between these two groups was aided by examining patterns of covariates, wherein the Family Disruption group was more likely to have additional family vulnerabilities and less likely to have psychosocial resources, as compared to the Income Disruption group. In contrast, the Income Disruption group was most impacted by financial concerns, without associated family vulnerabilities. Both groups are concerning in that they make up a significant segment of the sample (about 20% each) and have marked risk factors for subsequent family dysfunction and mental health challenges amongst family members. For the Family Disruption group, it appears that the stress of the pandemic had already permeated their family system during the first lockdown. This may be due in part to pre-existing mental health concerns amongst family members or

sensitization to pandemic stress as a function of caregivers' histories of early adversity (McLaughlin et al., 2010; Wade et al., 2021b). In any case, there are significant concerns about the subsequent impact of these family disruptions to the health and well-being of the family systems and its members. In contrast, for the Income Disruption group, it appears that there are mechanisms at play that are protecting the family system from dysfunction, perhaps related to drawing on social supports, better overall mental health amongst family members, and/or the pandemic representing a situation-specific/time-limited stressor (in contrast to other groups who have a long history of vulnerability). However, economic hardship in families, and the associated economic pressure on caregivers, has been robustly linked to negative cascading mechanisms within family systems (Conger & Conger, 2002; Masarik & Conger, 2017). As such, it will be important to monitor these families over time to support financial stability and ensure integrity of familial relationships as we proceed in pandemic recovery efforts.

Notably, the differences between the identified profiles are best distinguished between differences in pandemic-related disruption rather than positive adaptation. That is, there do not appear to be prominent differences between subgroups in absolute levels of positive adaptation (all reported small to moderate positive adaptation with a mean just below 2 on a scale of 1–3). However, it is worth noting that there were within-profile patterns. Specifically, it is useful to consider caregivers' self-reported positive adaptation in relation to stress levels, wherein the Low Disruption group has relatively more positive adaptation relative to stress, in contrast to the Multi-Domain Disruption group which has higher stress than positive adaptation. The other two groups appear to show relatively stable levels of both stress and adaptation. Such a pattern further highlights the risky nature of the Multi-Domain Disruption group, in that they are showing high levels of disruption without accompanying changes that may foster family resilience. This contrasts with the Family and Income Disruption groups, respectively, which may be protected downstream by their families' coping behaviors. These, of course, are merely hypotheses and remain to be empirically examined.

## Limitations

The current study is best interpreted while considering limitations. First, these profiles of risk are restricted to our sample and thus caution should be taken in generalizing to the general population. Specifically, individuals from minoritized communities and those with existing socioeconomic disadvantage have been disproportionately impacted by the pandemic (Benfer et al., 2021; Condon et al., 2020; Wamser-Nanney et al., 2021). However, most participants in

our sample were White-European, married, and had some post-secondary education. These sample characteristics are notable when we are identifying profiles of risk, and proportions within groups. That is, had our sample been more representative and included a more diverse set of participants, we might have observed a smaller proportion of participants falling in the Low Disruption group. We also cannot rule out that a more diverse sample may have fundamentally altered the quantitative or qualitative nature of the profiles themselves. For instance, in the Gassman-Pines (2020) study described above, with a sample of less than 20% White (non-Hispanic), 50% African American (non-Hispanic), and over 20% Hispanic participants, the majority of participants reported two or more COVID-19 hardships (with almost 70% reporting income loss alone). Thus, replication of these results with more diverse samples is needed. Relatedly, findings are specific to participants from regions within which participants reside, primarily the UK and the USA; patterns, proportions, and correlates of profiles should be examined in a diverse set of regions/countries to validate the identified 4-profile model. Another sample characteristic is that all families in the study had at least two children in the home as data come from a within-study, sibling comparison design. Thus, findings may not be generalizable to other family structures. Finally, all measurement was collected during the first wave of the pandemic, in May 2020. Conclusions about family disruption and adaptation are likely to change as the pandemic has persisted, given the role of severity and chronicity in determining stress response and positive adaptation (Masten & Motti-Stefanidi, 2020). This snapshot in time is just that: a picture of how families were strained and coping during the first wave of the lockdown. As such, it will be important to examine patterns of stress and positive adaptation at other time points in the pandemic.

Additional limitations relate to study measurement. There were some scales that were shortened to reduce overall participant burden. In this study, we used a shortened version of BCEs measure, omitting items of “opportunities to have a good time,” “liking/feeling comfortable with yourself,” and “predictable home routines.” This truncation of the scale may have reduced variability needed to identify differences between profiles on the extent of their BCEs. Furthermore, the reliability of two indicators (pandemic-specific stress and positive adaptation, respectively) was acceptable though relatively low. This may have been one reason why we found that positive adaptation did not differentiate profiles.

## Conclusion

The COVID-19 pandemic acted like a sledgehammer to family life in the early months of the pandemic, disrupting rituals, routines, and relationships of families worldwide

(Eales et al., 2021). Though the lives of all families were disrupted to some degree, mounting evidence points to the unequal impact of the pandemic on the stress and well-being of caregivers, families, and children. Relatedly, not all families will adapt to the pandemic similarly—some will be overcome by adversity and lack the internal and external resources needed to cope, while others may draw closer, grow together, and even thrive. It is of the utmost importance to consider the needs of the most vulnerable families during the pandemic, including how public programming and policy impacts the daily lives, finances, and family relationships of those with young children. Most importantly, leveraging family strengths through processes of meaning-making and building hope, positive communication and problem-solving, and closeness/connection are critical to promoting family recovery during and following this global crisis (Walsh, 2015).

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## Declarations

**Ethics Approval** Ethics approval for the current study was obtained from the research ethics boards of the universities of all listed authors.

**Competing Interests** The authors declare no competing interests.

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