



Child Deprivation as a Mediator of the Relationships between Family Poverty, Bullying Victimization, and Psychological Distress

Ji-Kang Chen¹ · Zhiyou Wang¹ · Hung Wong¹ · Vera Mun-yu Tang²

Accepted: 16 June 2021 / Published online: 28 July 2021
© The Author(s), under exclusive licence to Springer Nature B.V. 2021

Abstract

The paper examined the mediating effect of child deprivation on the associations between family poverty (i.e., relative poverty and household deprivation), bullying victimization, and psychological distress in an Asian/Chinese society (Hong Kong), and further examined sex differences in the interrelationships of family poverty, child deprivation, bullying victimization, and psychological distress. Data were collected from a random sample of 792 children and their adults living in the same households. The structural equation modeling analysis showed that family poverty did not predict bullying victimization and psychological distress directly but influenced both bullying victimization and psychological distress indirectly through child deprivation. No sex differences were found in the interrelationships between variables in the model. Our findings provide empirical support that child deprivation may play a crucial mediating role in the relationship between family poverty and its negative outcomes on children. This study also provides empirical evidence supporting that reducing child deprivation may effectively prevent the negative effects of family poverty on children's behavioral and psychological health.

Keywords Relative poverty · Household deprivation · Child deprivation · Bullying victimization · Psychological distress

1 Introduction

Bullying victimization and psychological distress are of significant concern to children and adolescents worldwide, particularly in Chinese societies (e.g., Chen & Chen, 2020a; Chen et al., 2020b). Among the correlates, family poverty is

✉ Ji-Kang Chen
jkchen@swk.cuhk.edu.hk

¹ Department of Social Work, The Chinese University of Hong Kong, Sha Tin, Hong Kong

² Asia-Pacific Institute of Ageing Studies, Lingnan University, Tuen Mun, Hong Kong

considered as one of the major factors negatively influencing children's psychological and behavioral health (Baker et al., 2018; Hymel & Swearer, 2015; Pryor et al., 2019). Until now, a substantial body of empirical studies has examined outcomes of family poverty on children's psychological distress and bullying victimization in Western countries (e.g., Elmore & Crouch, 2020; Flouri et al., 2014; Garner & Hinton, 2010; Masarik & Conger, 2017). Relatively less research was conducted in Asian or Chinese cultural contexts (e.g., Chen et al., 2020a; Ho et al., 2014). Furthermore, the findings of previous empirical studies on the negative outcomes of family poverty on children's psychological health and bullying were contradictory, with some indicating strong associations (Fu et al., 2013; Kim et al., 2019; Reiss, 2013; Seo et al., 2017; Wu & Qi, 2020; Yilmaz et al., 2020) and others showing the weak or insignificant relationships (Bilić, 2015; Chen & Astor, 2010; Chen & Wei, 2011a, b; Chen et al., 2020a; Ge, 2020; Jiang et al., 2018). The inconsistent findings raised a question about the potential mediating mechanism that could explain the link from family poverty to children's psychological distress and bullying victimization (McLoyd, 1998; Sirin, 2005).

Child deprivation referred to the lack of necessities, such as food, clothing, transportation, social activities, and education support, due to limited family resources, as identified by the children (Grødem, 2008; Lau & Bradshaw, 2018; Saunders & Tang, 2019). The extant literature suggests that child deprivation could be a potential mediator between family poverty and its negative outcomes on children and adolescents (Newton & Bower, 2005; Raphael, 2006). For example, the model of the social determinants of health points out that family poverty (e.g., relative poverty and household deprivation) is one of the major structural determinants linked to children's mental and behavioral health outcomes via intermediary determinants, such as child deprivation (Newton & Bower, 2005; Raphael, 2006; Wilkinson & Marmot, 2003). Accordingly, children living in relatively poor and deprived families are more likely to encounter deprivation, which increases their vulnerability to bullying victimization and psychological distress. However, empirical evidence to support such a proposition, particularly in Asian or Chinese societies, is lacking.

In addition, most of previous studies on negative outcomes of family poverty on children measured family poverty by asking children a single or just a few questions about their perceptions of household and parents' income or family socioeconomic status (SES) (e.g., Baker et al., 2018; Chen & Astor, 2010; Chen & Wei, 2011a, b; Fu et al., 2013). It is problematic because previous studies have argued that children's reports of household and parents' income or family SES might not reflect the real conditions of family poverty or socioeconomic conditions, decreasing the research validity of these studies (Chen et al., 2020a; Munsell et al., 2016). Furthermore, family poverty is a multifaceted concept (Aber et al., 2007; Chan & Wong, 2020; Haveman, 2009; Mack & Lansley, 1985; Zhang et al., 2019), which usually includes absolute poverty (i.e., family income that is below an objective external standard and fails to meet the basic needs of life; Foster, 1998), relative poverty (i.e., poverty condition relative to family within a society; Foster, 1998), subjective poverty (i.e., perception of or feeling about current poverty status; Mahmood et al., 2019), and deprivation (i.e., the lack of necessary items or resources due to limited economic conditions; Townsend, 1987). Researchers have stressed that it is

important to investigate negative outcomes of different dimensional family poverty on children and suggested that relative poverty and household deprivation are the major factors negatively influencing children's mental health and behavioral outcomes (Chung et al., 2018; Schenck-Fontaine et al., 2020; Reiss, 2013; Wu & Qi, 2020). However, until now, there is a lack of empirical studies to support the link from relative poverty and household deprivation to children's psychological distress and bullying victimization. As a result, how relative poverty and deprivation influence children's psychological and behavioral health is still unknown.

Using a random sample and multi-information data from adults and children in the same households in Hong Kong, this study aimed to provide empirical support to a proposed theoretical model of the indirect relationship of family poverty with children's psychological distress and bullying victimization mediated by child deprivation. Unlike previous studies relying on single poverty dimension and children's perceptions of household income and family SES, this study measured family poverty using household relative poverty and deprivation reported by the adults living with children in the same households.

Family poverty is an issues of global concern. There is no exception to Hong Kong (Lau et al., 2019; Wong & Chan, 2019). The most updated statistics suggested that the Gini index in Hong Kong is one of the highest among the developed nations/societies (The World Bank, 2020), meaning that the family income disparity in Hong Kong is more severe than most countries and societies in the world. A recent report also showed high level of child poverty rate (i.e., 17.8% in 2019) in Hong Kong (Hong Kong Special Administration Region Government, 2019). Given the situation of poverty in Hong Kong and other countries, there is an urgent need for more research to further understand the pathway from family poverty to children's well-beings. This study may be critical important in laying the groundwork for understanding how relative poverty and household deprivation are linked to children's psychological and behavioral health mediated via child deprivation. It is hope that this study may provide more information to school professionals, social workers and governments in Hong Kong to develop effective interventions to promote the psychological and behavioral well-being of children living in poverty.

2 Literature Review

2.1 Links from Family Poverty to Children's Deprivation, Psychological Distress, and Bullying Victimization

Several theories have proposed a significant link from family poverty to child deprivation, children's psychological distress, and bullying victimization. For example, the family investment model suggests that families with higher income are more likely to invest more in material things for their children (Bornstein, 2006; Bradley & Corwyn, 2004; Brooks-Gunn & Markman, 2005; Conger & Donnellan, 2007; Vasilyeva et al., 2018). This model predicted that children from low-income families with limited money on children's immediate needs and necessities of life are more likely to report lacking daily necessities and experiencing child

deprivation (Schofield et al., 2011). Previous empirical studies also support such a direct link (Bárcena-Martín et al., 2017; Liou, 2017). In addition, the family stress model argued that family poverty and economic hardships exacerbate children's psychological and behavioral maladjustment, which may increase their chances of being bullied and experiencing psychological disturbances (Aneshensel, 1992, 2009; Masarik & Conger, 2017; Pearlin, 1989). The social causation theory also posits that family poverty or economic hardship increases the risk of children's mental and psychological distress (Mossakowski, 2014). However, empirical studies on the link from family poverty to children's psychological health and bullying victimization showed contradicting results. For example, some studies have indicated that adolescents who come from poor or low SES families are more likely to report psychological distress (Kim et al., 2019; Wu & Qi, 2020; Yilmaz et al., 2020) and bullying victimization (Lemstra et al., 2012; Seo et al., 2017; Wang et al., 2019). However, others found weak or insignificant associations of family poverty with children's psychological health (Ge, 2020; Jiang et al., 2018; Johnson et al., 2019) and bullying (Chen & Astor, 2010; Chen & Wei, 2011a, b; Chen et al., 2020a; Tippett & Wolke, 2014). Previous meta-analyses have also indicated a weak or insignificant association between family poverty and bullying victimization (Bilić, 2015; Tippett & Wolke, 2014).

Most abovementioned studies on the effects of family poverty on children's psychological and behavioral health have measured family poverty by asking children a few questions about their perception of family incomes and family SES (Baker et al., 2018; Chen & Astor, 2010; Chen & Wei, 2011a, b). Such measuring methods may not reflect the reality of family poverty situation and diminish the research validity (Chen et al., 2020a; Garner & Hinton, 2010; Khoury-Kassabri et al., 2004). Furthermore, family poverty is a multifaceted concept including absolute poverty, subjective poverty, relative poverty and deprivation (Aber et al., 2007; Haveman, 2009; Mack & Lansley, 1985). Researchers argued that it is beneficial to theory, policy and practice to examine how multiple dimensional family poverty independently and jointly affects children's psychological and behavioral well-being (Chung et al., 2018; Gordon & Nandy, 2012; Schenck-Fontaine et al., 2020; Reiss, 2013; Wu & Qi, 2020). Relative poverty and household deprivation have been considered as major factors negatively influencing children's mental health and behavioral outcomes (Chung et al., 2018; Gordon & Nandy, 2012; Schenck-Fontaine et al., 2020; Reiss, 2013). However, empirical studies on the influence of relative poverty and household deprivation on children's bullying victimization and psychological distress are lacking. As a result, the association of relative poverty and household deprivation with bullying victimization and psychological distress is unclear.

2.2 Links from Child Deprivation to Bullying Victimization, and Psychological Distress

Previous studies have supported the link from child deprivation to children's bullying victimization and psychological distress. For example, empirical studies have shown that children suffering from material deprivation are more likely to have low

self-esteem; to be socially withdrawn, rejected by school peers, and less popular among peers; and to experience more conflicts with their peers compared to non-deprived children (Fujiwara et al., 2019; Hjalmarsson, 2018; Orth, 2018; Saunders et al., 2018), which were assumed as risk factors, increasing deprived children's vulnerability to bullying (Fanti & Henrich, 2015; Hong et al., 2017; Serdiouk et al., 2015). It has been documented that children experiencing material deprivation experienced emotional and mental health problems, such as anxiety, depression, and other psychological distress (Flouri & Sarmadi, 2016; Li et al., 2019; Meredith, 2015; Reiss, 2013).

2.3 Child Deprivation as a Mediator

As discussed in previous paragraphs, the contradictory findings on the link from family poverty to bullying victimization and psychological distress have raised a question of whether any potential mediators influence such link (McLoyd, 1998; Sirin, 2005). A review of the literature suggested that child deprivation may be one such mediator. For example, according to the family investment model, poor families are more likely to have limited money and resources to invest in children's necessities of life and which increases children's chances of being deprived (Conger & Donnellan, 2007; Schofield et al., 2011). Once children suffer from deprivation, they are more likely to have low self-esteem and be socially withdrawn and excluded by peers, which increases their vulnerability to bullying and psychological distress (McLeod & Kessler, 1990; Sidanius & Pratto, 2001).

In addition, the model of the social determinants of health may provide a framework to support our argument. For example, theories related to social determinants of health point out that both relative poverty and household deprivation are major structural determinants linked to children's mental and behavioral health outcomes via intermediary determinants, such as child deprivation (Newton & Bower, 2005; Raphael, 2006; Wilkinson & Marmot, 2003). Accordingly, children living in relatively poor and deprived families are more likely to encounter deprivation, which increases their vulnerability to bullying victimization and psychological distress. However, empirical evidence to support such a proposition, particularly in Asian or Chinese societies, is lacking. Thus, this study aimed to support empirically the theoretical model proposing that child deprivation plays a mediating role in the relationship of family poverty with children's bullying victimization and psychological distress in Hong Kong.

It has been argued that the interrelationship between family poverty, child deprivation, psychological distress, and bullying victimization may differ by sex. For example, the double jeopardy hypothesis argues that two or more concurrent social disadvantage sources might interact to predict poorer outcomes (Mendelson et al., 2008). Females are typically considered as the minority in Hong Kong society. Thus, the negative effects of family poverty and child deprivation may be more significant for girls than for boys. In addition, prior studies have shown that girls might be more vulnerable to stressors compared to boys (Bonanno et al., 2007; Stroud et al., 2002). Family poverty and child deprivation have been viewed as influential

stressors threatening children's psychological and behavioral health (Baker et al., 2018; Hymel & Swearer, 2015; Pryor et al., 2019). Accordingly, the interrelationships between family poverty, child deprivation, psychological distress, and bullying may be stronger among girls than among boys. However, sex differences in the correlations between poverty and children's internalizing/externalizing problems were generally weak and insignificant (e.g., Reiss, 2013), suggesting that sex differences may not be found in the interrelationships. As a result, it remains questionable whether sex differences exist in the interrelationships among family poverty, child deprivation, psychological distress, and bullying victimization among adolescents. The current investigation attempted to explore such sex differences.

2.4 Theoretical Model

Based on the above-mentioned literature review, the study proposed a theoretical model that children from poverty families (i.e., families with a high level of relative poverty and household deprivation) are more likely to experience bullying and suffer from psychological distress. This model proposes that family poverty indirectly influences children's bullying victimization and psychological distress through child deprivation. The model was expected to fit both male and female children.

3 Method

3.1 Data and Sampling

The data used in this study was derived from the first wave survey data of a research project—Trends and Implications of Poverty and Social Disadvantages in Hong Kong: A Multi-disciplinary and Longitudinal Study collected between June 2014 and August 2015 from a random sample of households in Hong Kong via face-to-face interviews. A two-stage stratified probability sample design was adopted, with the records in the frame of living quarters first stratified by geographical area and then by type of living quarters. Overall, 25,000 addresses and 200 segments were obtained from the Hong Kong Census and Statistics Department based on the frame of quarters. In the first stage, a sample of living quarters was randomly selected. Next, all households residing in the living quarters were selected. In the second stage, respondents aged 18 years or above within each household were recruited to answer the adult questionnaire via face-to-face interviews. If the household had more than one adult, we selected the one whose birthday was coming up. For those households with children aged 10 to 17 years, all children in this age range were invited to complete the child questionnaire via face-to-face interview.

A total of 804 children completed the interview survey, with an 88.4 percent response rate. We excluded 12 youths who worked on a part-time or full-time basis and matched 792 students and their household adults in our final sample. Of this final sample, 429 (54.2%) children were boys, and 363 (45.8%) were girls. The mean age of the children in the final sample was 13.79 (SD=2.34).

3.2 Measures

3.2.1 Relative Poverty

To determine the income poverty situation of families, we used relative poverty, which defines poverty in terms of its relation to the standards that exist elsewhere in the society (Chung et al., 2018; Gordon & Spicker, 1999). Equalized household income was derived by dividing household income by the square root of the number of people in the household to account for economies of scale when comparing households of different sizes (OECD, 2012). Households with equalized monthly household incomes that fell below the relative poverty line, defined as half of the median equalized household monthly income in this study (i.e., HK\$6059.2), were classified as 'poor.' We used the difference between the equalized household income of the households and the relative poverty line as the relative poverty gap, which measure the level of income poverty of the household. A larger poverty gap means a higher level of income poverty.

3.2.2 Household Deprivation

The consensual approach begins by asking adult participants whether they perceive a list of items as necessary for all society members. The items themselves are intended to meet universal basic needs and thus reflect prevailing customs, as identified in focus group discussions held before surveying low-income groups and/or in international deprivation studies (modified appropriately to suit local Hong Kong conditions and cultural norms). In the current case, adults were shown a list of items on a set of cards and asked to sort them into items perceived as necessary for all adults in Hong Kong.

Out of the 23 adult items, 21 items were perceived as necessary by most adults (over 50%), satisfying the "political validity" condition for inclusion as a deprivation indicator (Gordon, 2006). The selected 21 items assessed the list of materials and social necessities, with 17 items related to material deprivation and four items related to social deprivation. A two-point scale (0 = yes and 1 = no) was provided for each item. The scores of household deprivation were calculated by summing these 21 items, with a higher score indicating that respondents lacked more necessities in their social and family life. The Cronbach's α of the scale was 0.83 in this study.

3.2.3 Child Deprivation

The children respondents followed the same procedure as the adult respondents to identify the necessary items from a list of 21 child items. In this study, most children (over 50%) perceived 14 out of 21 items as necessary. For those items/cards identified as necessary, children were asked to check whether they 'have,' 'do not have but would like,' and 'do not have and do not want' these items. The items that children identified that they lacked and wanted were coded as 1 = deprived. The items that children had or did not have and did not want were coded as 0 = not deprived. This approach was applied in previous studies on child

deprivation conducted by Lau and Bradshaw (2018), Main and Bradshaw (2012, 2014), Gordon and Nandy (2012), and Guio et al. (2017).

In addition, this 14-items scale of child deprivation included three indicators/subscales based on their content. We created a latent variable of child deprivation consisting of these three indicators/subscales. Each indicator/subscale score was computed by summing the number of items that children lacked and wanted, with higher scores indicating a greater level of deprivation. The first indicator/subscale consisted of six items, which asked children whether they have a list of necessities in their daily lives, such as enough warm clothes, pocket money, and mobile phones. The factor loading for this indicator was 0.66. The second indicator/subscale consisted of three items, which asked children about their participation in social activities with their friends, such as dining out or joining leisure activities with friends at least once per month. The factor loading for this indicator was 0.63. The third indicator/subscale consisted of five items, which asked children if they have a list of necessities for their education or school. For example, these five items included items asking children whether they have school uniforms of the correct size, educational games, books at home suitable for their age, and a suitable place at home to study or do homework and whether they participated in extra-curricular activities. The factor loading for this subscale was 0.65.

3.2.4 Bullying Victimization

This latent variable involved four items asking children how many times they have experienced bullying in the past couple of months. These four items were selected and adapted from a bullying scale in What About YOUth? 2014 survey (WAY 2014) (Mori, 2015) to assess whether children were physically bullied (e.g., being kicked or hit), verbally bullied (e.g., insulted), socially excluded by peers, and cyberbullied (e.g., being posted private photo or information without permission). Respondents indicated agreement on a five-point Likert scale (1 = never to 5 = several times per week) for each item. The factor loadings for physical, verbal, social, and cyber victimization were 0.64, 0.80, 0.90, and 0.57, respectively. The Cronbach's alpha for this scale was 0.73 in this study.

3.2.5 Psychological Distress

This latent variable involved four items selected from the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2001), asking children about their psychological discomforts and mental distress in the past six months. These four items measured whether children worried a lot (factor loading = 0.72), were constantly fidgeting (factor loading = 0.70), were unhappy, downhearted, or tearful (factor loading = 0.66), and had many fears or were easily scared (factor loading = 0.66). Respondents indicated their agreement with each item on a three-point scale (1 = not true to 3 = certainly true). The Cronbach's alpha for this scale was 0.78 in this study.

3.3 Analysis Plan

First, standard deviations and correlation coefficients of the variables examined in this study were calculated. Next, structural equation modeling (SEM) was conducted to examine the interrelationships between variables in this model using the AMOS program. Cross-group comparative analyses of SEM (Byrne, 2001) were further conducted to test sex similarities and differences in the interrelationships of family poverty, child deprivation, bullying victimization, and psychological distress in the proposed model.

SEM is a multivariate statistical analysis technique that takes a confirmatory approach to analyze structural theory describing relationships among endogenous factors (Byrne, 2001). In SEM, the entire hypothesized model can be examined simultaneously to determine the extent to which it is consistent with the data. SEM has been applied in different disciplines such as social science and medicine (e.g., Byrne, 2001).

4 Results

4.1 Descriptive Statistics

Table 1 shows descriptive statistics (mean and standard deviation) divided by sex for all the variables in this study. The correlations between the variables are shown in Table 2. The results showed that sex was not significantly associated with relative poverty ($r=0.03$, $p>0.05$), household deprivation ($r=-0.00$, $p>0.05$), child deprivation ($r=-0.05$, $p>0.05$), bullying victimization ($r=-0.05$, $p>0.05$), and psychological distress ($r=-0.02$, $p>0.05$). Bullying victimization and psychological distress were significantly correlated ($r=0.26$, $p<0.01$), and both were positively related with household deprivation (for bullying victimization: $r=0.11$, $p<0.01$; for psychological distress: $r=0.10$, $p<0.05$) and child deprivation (for bullying

Table 1 Means and standard deviations of each scale by sexes

	Overall	Sex	
		Male	Female
Relative poverty gap	-5346.42 (6206.04)	-5487.01 (6528.22)	-5180.27 (5806.85)
Household deprivation	0.81 (1.51)	0.81 (1.58)	0.80 (1.41)
Child deprivation	0.53 (0.69)	0.57 (0.71)	0.49 (0.67)
Bullying victimization	1.11 (0.39)	1.13 (0.44)	1.08 (0.32)
Psychological distress	1.58 (0.50)	1.58 (0.52)	1.57 (0.48)

Table 2 Inter-correlations between variables in this study

	1	2	3	4	5	6
1.Sex	–	.03	-.00	-.05	-.05	-.02
2.Relative poverty gap		–	.27**	.17**	.12**	.05
3.Household deprivation			–	.32**	.11**	.10*
4.Child deprivation				–	.26**	.20**
5.Bullying victimization					–	.26**
6.Psychological distress						–

Note: Gender is coded 1 = male, 2 = female; *P < .05, **P < .01

victimization: $r=0.26, p<0.01$; for psychological distress: $r=0.20, p<0.01$). Bullying victimization was also positively correlated with relative poverty gap ($r=0.12, p<0.01$), while psychological distress was not significantly associated with it ($r=0.05, p>0.05$). Finally, relative poverty was positively correlated with household deprivation ($r=0.27, p<0.01$).

4.2 Overall Model

The results showed that our theoretical model fit our data well [$\chi^2(57, N=792)=194.282, p<0.001$, and with $NFI=0.929, IFI=0.949, CFI=0.949$, and $RMSEA=0.055$]. This means that the data could explain the theoretical model of this study well. Figure 1 illustrates the paths in this model.

Figure 1 also shows that the direct links of both relative poverty gap and household deprivation with bullying victimization ($\beta=0.06$ and $\beta=-0.02$, respectively) and psychological distress ($\beta=0.00$ and $\beta=0.00$, respectively) were insignificant.

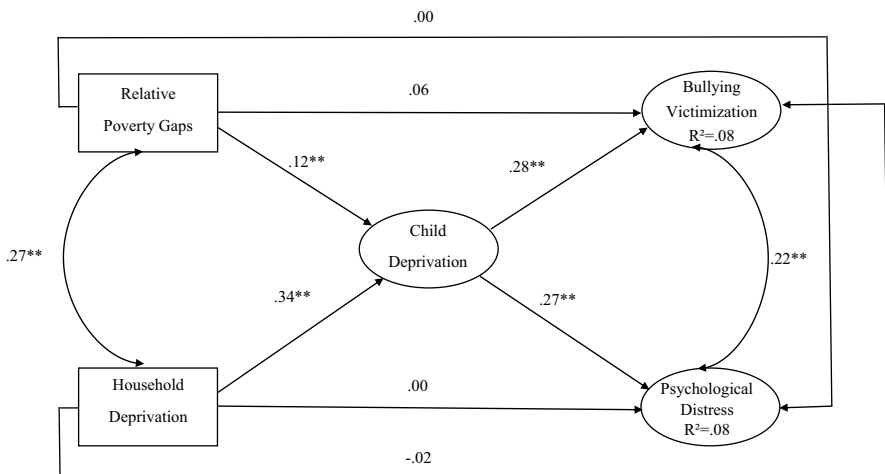


Fig. 1 Overall Sample. Structural equation modeling of direct and mediating effects on bullying victimization and psychological distress. ** $p<.01$

Next, we randomly generated 2,000 bootstrapping samples from the original dataset to assess the mediating effect of child deprivation in the relationships of both relative poverty gap and household deprivation with bullying victimization and psychological distress. The results showed that the indirect effects of relative poverty gap on bullying victimization and psychological distress mediated by child deprivation were 0.032 (SE = 0.013, CI = [0.016, 0.088], $p < 0.01$) and 0.031 (SE = 0.011, CI = [0.013, 0.058], $p < 0.01$), respectively. The indirect effects of household deprivation on bullying victimization and psychological distress mediated by child deprivation were 0.095 (SE = 0.033, CI = [0.038, 0.177], $p < 0.01$) and 0.094 (SE = 0.027, CI = [0.049, 0.166], $p < 0.01$), respectively. The empirical 95% confidence interval did not contain zero, signifying that relative poverty gap and household deprivation exerted a significant indirect effect on both bullying victimization and psychological distress via child deprivation. Overall, the values of variance explained for bullying victimization ($R^2 = 0.08$) and psychological distress ($R^2 = 0.08$) were comparable.

4.3 Sex Comparison

In this analysis, factor loadings, paths, and covariances were constrained to be equal to fit the covariance matrices of the male and female subgroups in the same model. The model provided a good fit to the data [χ^2 (122, N: male = 429, female = 363) = 300.451, $p < 0.001$, and with IFI = 0.935, CFI = 0.934, and RMSEA = 0.043]. Next, the model was examined to determine whether releasing

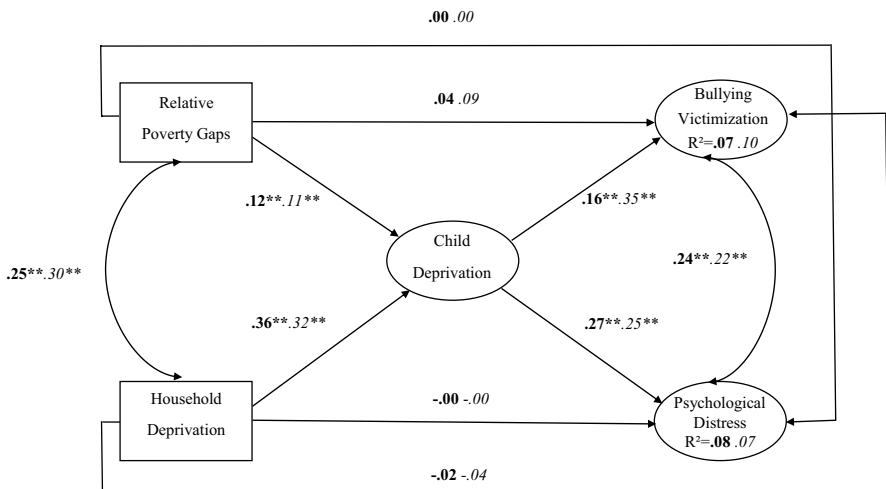


Fig. 2 Sex Comparison (Males in Bold, Females in Italics). Structural equation modeling of direct and mediating effects on male and female students' bullying victimization and psychological distress. The coefficients in bold and those in italics represent the results for the male and the female samples, respectively. ** $p < .01$

equality constraints on the paths could improve the fit. The results showed that unconstrained paths did not improve model fit, indicating insignificant sex differences in each of the structural paths in this model (Fig. 2).

5 Discussion

The research examined direct and indirect effects through child deprivation of family poverty (i.e., relative poverty and household deprivation) on children's bullying victimization and psychological distress and investigated sex differences in the inter-relationships between the variables in the theoretical model in an Asian, specifically Chinese, cultural context.

5.1 Overall Model

This study showed no significant direct link from relative poverty and household deprivation to bullying victimization and psychological distress. The findings conflict with theories, such as family stress theory and social causation theory, which predict a strong relationship between family poverty and children's outcomes (Aneshensel, 1992, 2009; Fu et al., 2013; Kim et al., 2019; Lemstra et al., 2012; Masarik & Conger, 2017; Mossakowski, 2014; Pearlin, 1989; Reiss, 2013; Seo et al., 2017; Wu & Qi, 2020; Yilmaz et al., 2020), but they are consistent with previous empirical studies showing a weak or insignificant association between poverty and its outcomes on children's mental health and bullying victimization (Bilić, 2015; Chen & Astor, 2010; Chen & Wei, 2011a, b; Chen et al., 2020a; Ge, 2020; Jiang et al., 2018; Johnson et al., 2019; Tippett & Wolke, 2014).

However, this study revealed that relative poverty and household deprivation are indirectly linked with bullying victimization and psychological distress through child deprivation. The findings indicated that children from impoverished families in Hong Kong are more likely to be deprived, increasing their risk of being victimized and suffering from mental health problems. These results support our proposed theoretical model arguing that child deprivation plays an influential mediating role in the association between family poverty and its negative outcomes. These findings also support the social determinants of health perspectives, which suggest that both relative poverty and deprivation are major structural determinants related to children's mental and behavioral health outcomes via intermediary factors, such as child deprivation (Newton & Bower, 2005; Raphael, 2006; Wilkinson & Marmot, 2003). This study provides empirical evidence that child deprivation is a unique factor contributing directly and indirectly to bullying victimization and psychological distress among Hong Kong children.

In addition, household deprivation had a stronger indirect effect on bullying victimization and psychological distress compared to relative poverty. The finding implied that children's bullying victimization and psychological distress are more likely to be indirectly associated with household deprivation than relative poverty. The findings imply that compared with relative poverty, household deprivation is a

stronger factor contributing to child deprivation, which increases children's risk of being bullied and suffering psychological distress (Bárcena-Martín et al., 2017).

5.2 Sex Differences

The theoretical model proposed in this study applied to both sexes, suggesting that child deprivation mediates the link from relative poverty and household deprivation to bullying victimization and psychological distress for male and female children similarly. The findings conflict with the double jeopardy hypothesis and previous studies, which argued that the interrelationships between variables in this model might be more pertinent to girls than to boys (e.g., Mendelson et al., 2008). However, our results echoed previous research inferring no significant sex differences in the interrelationships (e.g., Reiss, 2013). It thus appears that family poverty could lead to male and female children's deprivation to the same extent. Once they suffered from deprivation, male and female children in Hong Kong have an almost equal chance of being exposed to bullying and report similar psychological distress levels.

5.3 Limitations of the Study

Several limitations of this study should be noted. First, the data used in this study were cross-sectional; therefore, the results cannot be used to build causal relationships between family poverty, child deprivation, bullying victimization, and psychological distress. Further research needs to employ longitudinal data to confirm the causal relationships in this model. Second, the children self-reported the occurrences of bullying victimization and psychological distress; therefore, they may have under or over-reported their experiences, perhaps due to the potential social desirability bias (Chen & Chen, 2020a, b; Chen et al., 2020a). Researchers may consider including a scale measuring social desirability in future research to detect such an effect (Chen & Wei, 2013; Chen et al., 2020a). Finally, this study included a random sample from Hong Kong, and the findings may not be generalized to other countries, regions, or Chinese societies. Future researchers may replicate the theoretical model proposed in this study with samples from other countries, cultures, and societies to increase its generalizability.

5.4 Implications for Theory, Practice, and Policy

Unlike previous studies relying on single poverty dimension and children's perceptions of household income and family SES, this study measured family poverty using household relative poverty and deprivation reported by the adults living with children in the same households to examine a proposed theoretical model of the indirect relationship of different dimensional family poverty (i.e., relative poverty and household deprivation) with children's psychological distress and bullying victimization mediated by child deprivation. Our findings indicated relative poverty and household deprivation are indirectly linked with bullying victimization and

psychological distress through child deprivation rather than directly. This study provides evidence to support a joint effect of different family poverty dimension on children's mental health and bullying victimization. This study also support the social determinants of health perspectives, which suggest that both relative poverty and deprivation are major structural determinants related to children's mental and behavioral health outcomes via intermediary factors, such as child deprivation. This study provides empirical evidence that child deprivation is a unique factor contributing directly and indirectly to bullying victimization and psychological distress.

In addition, our results highlighted that child deprivation is a crucial variable contributing to bullying victimization and psychological distress among children in Hong Kong. To maximize the effectiveness, the finding indicates that future policies and interventions may focus on reducing child deprivation levels, which could effectively decrease the adverse effects of family poverty and child deprivation on psychological and behavioral outcomes.

Potential policies and interventions may consider providing children with a range of material resources, such as food, clothing, educational support, and opportunities to participate in social activities, rather than just giving out cash or voucher to low-income families (Li et al., 2019; Saunders et al., 2019) to help children overcome their perceptions of deprivation and reduce the risk of bullying victimization and mental health problems.

However, it does not mean that policies and interventions should only focus on child deprivation to prevent further bullying victimization and psychological distress. Our findings demonstrate that the direct effects of relative poverty and household deprivation on child deprivation are significant. Therefore, future intervention programs should also consider alleviating family poverty, particularly decreasing household deprivation, because compared to relative poverty, household deprivation was found to be more closely related to child deprivation in this study. In addition to monetary support, issues that poor people face, such as limited access to health care, discrimination in the labor market, information asymmetry, difficulty in accessing public services, and limited financial instruments due to language or ethnicity barriers, are more crucial risk factors of distress among low-income family members (Chan & Wong, 2020; Zhang et al., 2019). Policy and government should focus more on ensuring that low-income families can meet their specific daily needs and allocate resources to their children. For example, the Hong Kong government may consider granting child allowance to each child from the poor working families through the Working Family Allowance (WFA) Scheme to improve children's quality of life. The government should also improve other social policies and services, such as offering more social housing, strengthening the current public healthcare system, providing employment support, and expanding social service channels.

Finally, the results showed that the overall theoretical model applies to both male and female children. Hence, designing interventions or policies to reduce poverty based on our theoretical model could be effective for both sexes in Hong Kong.

Acknowledgements The work was supported by a Grant from the Central Policy Unit of the Government of the Hong Kong Special Administrative Region and the Research Grants Council of the Hong Kong Special Administrative Region, China (Project No. 4003-SPPR-11).

References

- Aber, J. L., Jones, S. M., & Raver, C. C. (2007). Poverty and child development: New perspectives on a defining issue. *American Psychological Association*. <https://doi.org/10.1037/11486-009>.
- Agnew, R. (1991). A longitudinal test of social control theory and delinquency. *Journal of Research in Crime and Delinquency*, 28(2), 126–156. <https://doi.org/10.1177/0022427891028002002>.
- Anderson, K. L. (1997). Gender, status, and domestic violence: An integration of feminist and family violence approaches. *Journal of Marriage and the Family*, 59(3), 655–669. <https://doi.org/10.2307/353952>.
- Aneshensel, C. S. (1992). Social stress: Theory and research. *Annual Review of Sociology*, 18(1), 15–38. <https://doi.org/10.1146/annurev.so.18.080192.000311>.
- Aneshensel, C. S. (2009). Toward explaining mental health disparities. *Journal of Health and Social Behavior*, 50(4), 377–394. <https://doi.org/10.1177/002214650905000401>.
- Atkinson, M. P., Greenstein, T. N., & Lang, M. M. (2005). For women, breadwinning can be dangerous: Gendered resource theory and wife abuse. *Journal of Marriage and Family*, 67(5), 1137–1148. <https://doi.org/10.1111/j.1741-3737.2005.00206.x>.
- Baker, C. E., Kainz, K. L., & Reynolds, E. R. (2018). Family poverty, family processes and children's preschool achievement: Understanding the unique role of fathers. *Journal of Child and Family Studies*, 27(4), 1242–1251. <https://doi.org/10.1007/s10826-017-0947-6>.
- Bárceña-Martín, E., Blázquez, M., Budría, S., & Moro-Egido, A. I. (2017). Child and household deprivation: A relationship beyond household socio-demographic characteristics. *Social Indicators Research*, 132(3), 1079–1098. <https://doi.org/10.1007/s11205-016-1331-4>.
- Bilić, V. (2015). The role of socioeconomic differences and material deprivation in peer violence. *Epiphany. Journal of Transdisciplinary Studies*, 8(2), 177–202. <https://doi.org/10.21533/epiphany.v8i2.169>.
- Bonanno, G. A., Galea, S., Bucchiarelli, A., & Vlahov, D. (2007). What predicts psychological resilience after disaster? The role of demographics, resources, and life stress. *Journal of Consulting and Clinical Psychology*, 75, 671–682. <https://doi.org/10.1037/0022-006X.75.5.671>.
- Bornstein, M. H. (2006). Parenting science and practice. In K. A. Renninger, I. E. Sigel, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology, Vol. 4: Child psychology in practice* (pp. 893–949). (6th ed.). Wiley.
- Bradley, R. H., & Corwyn, R. F. (2004). *Family process investments that matter for child wellbeing. Family investments in children's potential: Resources and parenting behaviors that promote success*. Lawrence Erlbaum Associates.
- Breslau, N. (2009). The epidemiology of trauma, PTSD, and other post trauma disorders. *Trauma, Violence, & Abuse*, 10(3), 198–210. <https://doi.org/10.1177/1524838009334448>.
- Brooks-Gunn, J., & Markman, L. B. (2005). The contribution of parenting to ethnic and racial gaps in school readiness. *The Future of Children*, 15(1), 139–168. <https://doi.org/10.1353/foc.2005.0001>.
- Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Lawrence Erlbaum Associates Publishers.
- Chan, S. M., & Wong, H. (2020). Impact of income, deprivation and social exclusion on subjective poverty: A structural equation model of multidimensional poverty in Hong Kong. *Social Indicators Research*, 152, 1–20. <https://doi.org/10.1007/s11205-020-02476-8>.
- Chen, J. K., & Astor, R. A. (2010). School violence in Taiwan: Examining how Western risk factors predict school violence in an Asian culture. *Journal of Interpersonal Violence*, 25(8), 1388–1410. <https://doi.org/10.1177/0886260509354576>.
- Chen, J. K., & Chen, L. M. (2020a). A cross-national examination of school violence and nonattendance due to school violence in Taiwan, Hong Kong, and Mainland China: A rasch model approach. *Journal of School Violence*, 19(2), 177–191. <https://doi.org/10.1080/15388220.2019.1568882>.
- Chen, J. K., & Chen, L. M. (2020b). Cyberbullying among adolescents in Taiwan, Hong Kong, and Mainland China: A cross-national study in Chinese societies. *Asia Pacific Journal of Social Work and Development*, 30(3), 227–241. <https://doi.org/10.1080/02185385.2020.1788978>.
- Chen, J. K., & Wei, H. S. (2011a). Student victimization by teachers in Taiwan: Prevalence and associations. *Child Abuse & Neglect*, 35(5), 382–390. <https://doi.org/10.1016/j.chiabu.2011.01.009>.

- Chen, J. K., & Wei, H. S. (2011b). The impact of school violence on self-esteem and depression among Taiwanese junior high school students. *Social Indicators Research*, *100*(3), 479–498. <https://doi.org/10.1007/s11205-010-9625-4>.
- Chen, J. K., & Wei, H. S. (2013). School violence, social support and psychological health among Taiwanese junior high school students. *Child Abuse & Neglect*, *37*(4), 252–262. <https://doi.org/10.1016/j.chiabu.2013.01.001>.
- Chen, J. K., Wu, C., & Wei, H. S. (2020a). Personal, family, school, and community factors associated with student victimization by teachers in Taiwanese junior high schools: A multi-informant and multilevel analysis. *Child Abuse & Neglect*, *99*, 104246. <https://doi.org/10.1016/j.chiabu.2019.104246>.
- Chen, J. K., Wu, C., Chang, C. W., & Wei, H. S. (2020b). Indirect effect of parental depression on school victimization through adolescent depression. *Journal of Affective Disorders*, *263*(15), 396–404. <https://doi.org/10.1016/j.jad.2019.11.126>.
- Chung, R. Y. N., Chung, G. K. K., Gordon, D., Wong, S. Y. S., Chan, D., Lau, M. K. W., ... & Wong, H. (2018). Deprivation is associated with worse physical and mental health beyond income poverty: A population-based household survey among Chinese adults. *Quality of Life Research*, *27*(8), 2127–2135.
- Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*, *58*, 175–199. <https://doi.org/10.1146/annurev.psych.58.110405.085551>.
- Elmore, A. L., & Crouch, E. (2020). The Association of adverse childhood experiences with anxiety and depression for children and youth, 8 to 17 years of age. *Academic Pediatrics*, *20*(5), 600–608. <https://doi.org/10.1016/j.acap.2020.02.012>.
- Fanti, K. A., & Henrich, C. C. (2015). Effects of self-esteem and narcissism on bullying and victimization during early adolescence. *The Journal of Early Adolescence*, *35*(1), 5–29. <https://doi.org/10.1177/0272431613519498>.
- Flouri, E., & Sarmadi, Z. (2016). Prosocial behavior and childhood trajectories of internalizing and externalizing problems: The role of neighborhood and school contexts. *Developmental Psychology*, *52*(2), 253. <https://doi.org/10.1037/dev0000076>.
- Flouri, E., Midouhas, E., & Joshi, H. (2014). Family poverty and trajectories of children's emotional and behavioural problems: The moderating roles of self-regulation and verbal cognitive ability. *Journal of Abnormal Child Psychology*, *42*(6), 1043–1056. <https://doi.org/10.1007/s10802-013-9848-3>.
- Foster, J. (1998). Absolute versus relative poverty. *The American Economic Review*, *88*(2), 335–341.
- Fu, Q., Land, K. C., & Lamb, V. L. (2013). Bullying victimization, socioeconomic status and behavioral characteristics of 12th graders in the United States, 1989 to 2009: Repetitive trends and persistent risk differentials. *Child Indicators Research*, *6*(1), 1–21. <https://doi.org/10.1007/s12187-012-9152-8>.
- Fujiwara, T., Isumi, A., & Ochi, M. (2019). Pathway of the association between child poverty and low self-esteem: Results from a population-based study of adolescents in Japan. *Frontiers in Psychology*, *10*, 937. <https://doi.org/10.3389/fpsyg.2019.00937>.
- Garner, P. W., & Hinton, T. S. (2010). Emotional display rules and emotion self-regulation: Associations with bullying and victimization in community-based after school programs. *Journal of Community & Applied Social Psychology*, *20*(6), 480–496. <https://doi.org/10.1002/casp.1057>.
- Ge, T. (2020). Effect of socioeconomic status on children's psychological well-being in China: The mediating role of family social capital. *Journal of Health Psychology*, *25*(8), 1118–1127. <https://doi.org/10.1177/1359105317750462>.
- Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*(11), 1337–1345.
- Gordon, D. (2006). The concept and measurement of poverty. In C. Pantazis, D. Gordon, & R. Levitas (Eds.), *Poverty and Social Exclusion in Britain: The Millennium Survey* (pp. 29–63). Policy Press.
- Gordon, D., & Nandy, S. (2012). Measuring child poverty and deprivation. In A. Minujin & S. Nandy (Eds.), *Global child poverty and well-being: Measurement, concepts, policy and action* (pp. 57–101). Policy Press.
- Gordon, D., & Spicker, P. (1999). *The International Glossary on Poverty*. CROP Publications.
- Grødem, A. S. (2008). Household Poverty and Deprivation Among Children. *Childhood*, *15*, 107–125. <https://doi.org/10.1177/0907568207086839>.
- Guio, A.-C., Gordon, D., & Marlier, E. (2017). Measuring child material deprivation in the EU. In A. Atkinson, A.-C. Guio, & E. Marlier (Eds.), *Monitoring social inclusion in Europe* (pp. 209–223). Office of the European Union.

- Haveman, R. (2009). What does it mean to be poor in a rich society? *Focus*, 26(2), 81–86. Retrieved from <http://digital.library.wisc.edu/1793/36290>. Accessed 28 June 2021.
- Hjalmarsson, S. (2018). Poor kids? Economic resources and adverse peer relations in a nationally representative sample of Swedish adolescents. *Journal of Youth and Adolescence*, 47(1), 88–104. <https://doi.org/10.1007/s10964-017-0747-8>.
- Ho, K. Y., Li, W. H. C., & Chan, S. S. C. (2014). The effect of poverty and income disparity on the psychological well-being of Hong Kong children. *Public Health Nursing*, 32(3), 212–221.
- Hong Kong Special Administration Region Government. (2019). *Hong Kong poverty situation report 2019*. Hong Kong Special Administration Region Government.
- Hong, J. S., Kim, D. H., & Piquero, A. R. (2017). Assessing the links between punitive parenting, peer deviance, social isolation and bullying perpetration and victimization in South Korean adolescents. *Child Abuse & Neglect*, 73, 63–70. <https://doi.org/10.1016/j.chiabu.2017.09.017>.
- Hymel, S., & Swearer, S. M. (2015). Four decades of research on school bullying: An introduction. *American Psychologist*, 70(4), 293–299. <https://doi.org/10.1037/a0038928>.
- Jiang, S., Li, C., & Fang, X. (2018). Socioeconomic status and children's mental health: Understanding the mediating effect of social relations in Mainland China. *Journal of Community Psychology*, 46(2), 213–223. <https://doi.org/10.1002/jcop.21934>.
- Johnson, S. E., Lawrence, D., Perales, F., Baxter, J., & Zubrick, S. R. (2019). Poverty, parental mental health and child/adolescent mental disorders: Findings from a national Australian survey. *Child Indicators Research*, 12(3), 963–988. <https://doi.org/10.1007/s12187-018-9564-1>.
- Khoury-Kassabri, M., Benbenishty, R., Avi Astor, R., & Zeira, A. (2004). The contributions of community, family, and school variables to student victimization. *American Journal of Community Psychology*, 34(3–4), 187–204. <https://doi.org/10.1007/s10464-004-7414-4>.
- Kim, Y., Lee, S., Jung, H., Jaime, J., & Cubbin, C. (2019). Is neighborhood poverty harmful to every child? Neighborhood poverty, family poverty, and behavioral problems among young children. *Journal of Community Psychology*, 47(3), 594–610. <https://doi.org/10.1002/jcop.22140>.
- Lau, M., & Bradshaw, J. (2018). Material well-being, social relationships and children's overall life satisfaction in Hong Kong. *Child Indicators Research*, 11, 185–205. <https://doi.org/10.1007/s12187-016-9426-7>.
- Lau, M., Gordon, D., Zhang, M., & Bradshaw, J. (2019). Children's and adults' perceptions of child necessities in Hong Kong. *Social Policy and Administration*, 53, 835–853.
- Lemstra, M. E., Nielsen, G., Rogers, M. R., Thompson, A. T., & Moraros, J. S. (2012). Risk indicators and outcomes associated with bullying in youth aged 9–15 years. *Canadian Journal of Public Health*, 103(1), 9–13. <https://doi.org/10.1007/BF03404061>.
- Li, C., Wu, Q., & Liang, Z. (2019). Effect of poverty on mental health of children in rural China: The mediating role of social capital. *Applied Research in Quality of Life*, 14(1), 131–153. <https://doi.org/10.1007/s11482-017-9584-x>.
- Liou, H. C. (2017). Child poverty and its impacts on social exclusion in Taiwan. *Journal of Asian Public Policy*, 10(2), 198–215. <https://doi.org/10.1080/17516234.2016.1205342>.
- Mack, J., & Lansley, S. (1985). *How poor is too poor? Defining poverty*. Poor Britain. George Allen & Unwin.
- Mahmood, T., Yu, X., & Klasen, S. (2019). Do the poor really feel poor? Comparing objective poverty with subjective poverty in Pakistan. *Social Indicators Research*, 142(2), 543–580. <https://doi.org/10.1007/s11205-018-1921-4>.
- Main, G., & Bradshaw, J. (2012). A Child Material Deprivation Index. *Child Indicators Research*, 5(3), 503–521. <https://doi.org/10.1007/s12187-012-9145-7>.
- Main, G., & Bradshaw, J. (2014). Children's necessities: Trends over time in perceptions and ownership. *Journal of Poverty and Social Justice*, 22(3), 193–208. <https://doi.org/10.1332/175982714X14120854997529>.
- Masarik, A. S., & Conger, R. D. (2017). Stress and child development: A review of the family stress model. *Current Opinion in Psychology*, 13, 85–90. <https://doi.org/10.1016/j.copsyc.2016.05.008>.
- McLeod, J. D., & Kessler, R. C. (1990). Socioeconomic status differences in vulnerability to undesirable life events. *Journal of Health and Social Behavior*, 31(2), 162–172. <https://doi.org/10.2307/2137170>.
- McLoyd, V. (1998). Socioeconomic disadvantage and child development. *American Psychologist*, 53(2), 185–204. <https://doi.org/10.1037/0003-066X.53.2.185>.

- Mendelson, T., Kubzansky, L. D., Datta, G. D., & Buka, S. L. (2008). Relation of female gender and low socioeconomic status to internalizing symptoms among adolescents: A case of double jeopardy. *Social Science & Medicine*, 66(6), 1284–1296. <https://doi.org/10.1016/j.socscimed.2007.11.033>.
- Meredith, R. M. (2015). Sensitive and critical periods during neurotypical and aberrant neurodevelopment: A framework for neurodevelopmental disorders. *Neuroscience & Biobehavioral Reviews*, 50, 180–188. <https://doi.org/10.1016/j.neubiorev.2014.12.001>.
- Mori, I. (2015). Health and Wellbeing of 15 year olds in England – What About YOUTH? Survey 2014 – Technical Report. Retrieved from <https://files.digital.nhs.uk/publicationimport/pub19xxx/pub19244/what-about-youth-eng-tech-rep.pdf>. Accessed 28 June 2021.
- Mossakowski, K. N. (2014). Social causation and social selection. *The Wiley Blackwell Encyclopedia of Health, Illness, Behavior, and Society*, 2154–2160. <https://doi.org/10.1002/9781118410868.wbehibs262>.
- Munsell, E. P., Kilmer, R. P., Vishnevsky, T., Cook, J. R., & Markley, L. M. (2016). Practical disadvantage, socioeconomic status, and psychological well-being within families of children with severe emotional disturbance. *Journal of Child and Family Studies*, 25(9), 2832–2842. <https://doi.org/10.1007/s10826-016-0449-y>.
- Newton, J. T., & Bower, E. J. (2005). The social determinants of oral health: New approaches to conceptualizing and researching complex causal networks. *Community Dentistry and Oral Epidemiology*, 33(1), 25–34. <https://doi.org/10.1111/j.1600-0528.2004.00190.x>.
- OECD. (2012). Quality review of the OECD database on household incomes and poverty and the OECD earnings database part I. Retrieved from https://www.oecd.org/els/soc/OECDIncomeDistributionQualityReview_PartI.pdf. Accessed 29 June 2021.
- Orth, U. (2018). The family environment in early childhood has a long-term effect on self-esteem: A longitudinal study from birth to age 27 years. *Journal of Personality and Social Psychology*, 114(4), 637–655. <https://doi.org/10.1037/pspp0000143>.
- Pearlin, L. I. (1989). The sociological study of stress. *Journal of Health and Social Behavior*, 30(3), 241–256. <https://doi.org/10.2307/2136956>.
- Pryor, L., Strandberg-Larsen, K., Andersen, A. M. N., Rod, N. H., & Melchior, M. (2019). Trajectories of family poverty and children's mental health: Results from the Danish national birth cohort. *Social Science & Medicine*, 220, 371–378. <https://doi.org/10.1016/j.socscimed.2018.10.023>.
- Raphael, D. (2006). Social determinants of health: Present status, unanswered questions, and future directions. *International Journal of Health Services*, 36(4), 651–677. <https://doi.org/10.2190/3MW4-1EK3-DGRQ-2CRF>.
- Reiss, F. (2013). Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review. *Social Science & Medicine*, 90, 24–31. <https://doi.org/10.1016/j.socscimed.2013.04.026>.
- Saunders, P., & Tang, V. (2019). Adult and child deprivation in Hong Kong. *Social Policy & Administration*, 53, 820–834. <https://doi.org/10.1111/spol.12533>.
- Saunders, P., Brown, J. E., Bedford, M., & Naidoo, Y. (2019). Child deprivation in Australia: A child-focused approach. *Australian Journal of Social Issues*, 54(1), 4–21. <https://doi.org/10.1002/ajs4.61>.
- Saunders, P., Wong, H., & Wong, W. P. (2014). Deprivation and poverty in Hong Kong. *Social Policy & Administration*, 48(5), 556–575. <https://doi.org/10.1111/spol.12042>.
- Schenck-Fontaine, A., Lansford, J. E., Skinner, A. T., Deater-Deckard, K., Di Giunta, L., Dodge, K. A., ... & Malone, P. S. (2020). Associations between perceived material deprivation, parents' discipline practices, and children's behavior problems: An international perspective. *Child Development*, 91(1), 307–326. <https://doi.org/10.1111/cdev.13151>.
- Schofield, T. J., Martin, M. J., Conger, K. J., Neppl, T. M., Donnellan, M. B., & Conger, R. D. (2011). Intergenerational transmission of adaptive functioning: A test of the interactionist model of SES and human development. *Child Development*, 82(1), 33–47. <https://doi.org/10.1111/j.1467-8624.2010.01539.x>.
- Seo, H. J., Jung, Y. E., Kim, M. D., & Bahk, W. M. (2017). Factors associated with bullying victimization among Korean adolescents. *Neuropsychiatric Disease and Treatment*, 13, 2429. <https://doi.org/10.2147/NDT.S140535>.
- Serdiouk, M., Rodkin, P., Madill, R., Logis, H., & Gest, S. (2015). Rejection and victimization among elementary school children: The buffering role of classroom-level predictors. *Journal of Abnormal Child Psychology*, 43(1), 5–17. <https://doi.org/10.1007/s10802-013-9826-9>.
- Sidanius, J., & Pratto, F. (2001). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge University Press.

- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417–453. <https://doi.org/10.3102/00346543075003417>.
- Sourander, A., Helstelä, L., Helenius, H., & Piha, J. (2000). Persistence of bullying from childhood to adolescence—a longitudinal 8-year follow-up study. *Child Abuse & Neglect*, 24(7), 873–881. [https://doi.org/10.1016/S0145-2134\(00\)00146-0](https://doi.org/10.1016/S0145-2134(00)00146-0).
- Stroud, L. R., Salovey, P., & Epel, E. S. (2002). Sex differences in stress responses: Social rejection versus achievement stress. *Biological Psychiatry*, 52(4), 318–327. [https://doi.org/10.1016/S0006-3223\(02\)01333-1](https://doi.org/10.1016/S0006-3223(02)01333-1).
- Tajfel, H. (1974). *Social Identity and Intergroup Behaviour*. Information (international Social Science Council), 13(2), 65–93. <https://doi.org/10.1177/053901847401300204>.
- The World Bank. (2020). *2020 World Development Indicators*. The World Bank.
- Tippett, N., & Wolke, D. (2014). Socioeconomic status and bullying: A meta-analysis. *American Journal of Public Health*, 104(6), e48–e59. <https://doi.org/10.2105/AJPH.2014.301960>.
- Townsend, P. (1987). Deprivation. *Journal of Social Policy*, 16(2), 125–146.
- Vasilyeva, M., Dearing, E., Ivanova, A., Shen, C., & Kardanova, E. (2018). Testing the family investment model in Russia: Estimating indirect effects of SES and parental beliefs on the literacy skills of first-graders. *Early Childhood Research Quarterly*, 42, 11–20. <https://doi.org/10.1016/j.ecresq.2017.08.003>.
- Wang, M. S., Hong, J. S., Wei, H. S., & Hwang, Y. T. (2019). Multiple level factors associated with bullying victimization in Taiwanese middle school students. *Journal of School Violence*, 18(3), 375–387. <https://doi.org/10.1080/15388220.2018.1506927>.
- Wei, H. S., & Chen, J. K. (2014). The relationships between family financial stress, mental health problems, child rearing practice, and school involvement among Taiwanese parents with school-aged children. *Journal of Child and Family Studies*, 23(7), 1145–1154. <https://doi.org/10.1007/s10826-013-9772-8>.
- Wilkinson, R. & Marmot, M. (2nd edn.). (2003). *Social determinants of health: The solid facts*. World Health Organization. Copenhagen: WHO.
- Wong, H., & Chan, S. M. (2019). The impacts of housing factors on deprivation in a world city: The case of Hong Kong. *Social Policy and Administration*, 53(6), 1–17. <https://doi.org/10.1111/spol.12535>.
- Wu, Y., & Qi, D. (2020). Material deprivation, parenting practices, and children's psychological health and wellbeing in China. *Journal of Community Psychology*, 48(8), 2644–2662. <https://doi.org/10.1002/jcop.22441>.
- Yilmaz, F., Ozcan, D. G., Gokoglu, A. G., & Turkyilmaz, D. (2020). The effect of poverty on depression among Turkish children. *Child and Adolescent Social Work Journal*, 1–11. <https://doi.org/10.1007/s10560-020-00686-0>.
- Zhang, M., Zhang, J., Zhang, F., Zhang, L., & Feng, D. (2018). Prevalence of psychological distress and the effects of resilience and perceived social support among Chinese college students: Does gender make a difference? *Psychiatry Research*, 267, 409–413. <https://doi.org/10.1016/j.psychres.2018.06.038>.
- Zhang, Y., Wong, H., Chen, J. K., & Tang, V. M. (2019). Comparing income poverty gap and deprivation on social acceptance: A mediation model with interpersonal communication and social support. *Social Policy & Administration*, 53(6), 889–902. <https://doi.org/10.1111/spol.12536>.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.