

# Links between Poverty and Children’s Subjective Wellbeing: Examining the Mediating and Moderating Role of Relationships

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**Abstract** There is disagreement among studies about whether there is an association between poverty and the subjective wellbeing of children. One possible reason for this disagreement is that household income, an often-employed measure of child poverty, may not stably and accurately represent the real life experience of children; some studies have suggested, however, that material deprivation could be a better measure of child poverty. Also, the association between poverty and subjective wellbeing may not be that straightforward, as there could be underlying mechanisms (such as mediation and moderation) affecting its direction or strength. As suggested by empirical findings, family relationships and friendships could be potential mediators or moderators of the association between poverty and subjective wellbeing: poverty may affect relationships; relationships are an important factor in children’s subjective wellbeing; and economic status affects child outcomes, though not necessarily subjective wellbeing, via relationships. As the potential links have not been extensively explored, this study examines the possible role of family relationships and friendships as mediators or moderators between poverty—using child deprivation as its measure—and the subjective wellbeing of children. Results show that the effect of children’s material deprivation on their subjective wellbeing is mediated by their family relationships and friendships. Also, family relationships are a significant moderator. While the negative impact of child deprivation on subjective wellbeing could be exacerbated when family relationships are not well, good family relationships may prevent the further deterioration in subjective wellbeing. Implications of the findings are discussed.

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## 1 Introduction

The topic of the subjective wellbeing of children has drawn much international attention in the recent 2000s, with subjective sense of wellbeing along with other objective indicators of child wellbeing being compared across countries in UNICEF's Innocenti Report Card 7 (UNICEF 2007). Not long after this, the Stiglitz Commission urged countries to collect data on how their citizens feel about their lives in an effort to measure societal progress through a method that does not rely on GDP (Stiglitz et al. 2009). Under these contexts, there is a proliferation of literature on the subjective wellbeing of children, with an increasingly important thread focusing on its relationship with economic or poverty status (for example, Knies 2011; Rees et al. 2011; Bradshaw and Richardson 2009; Bradshaw et al. 2011; Main 2014). While it seems reasonable to expect economic status to positively relate to children's subjective wellbeing, inconsistent findings exist. While some results show a significant association between economic status, usually measured by income, and subjective wellbeing (Rees et al. 2011; Rees et al. 2012; Casas et al. 2013), others do not (Knies 2011; Carlsson et al. 2014). Even when the relationship is significant, the magnitude could nonetheless be limited (Rees et al. 2011; Rees et al. 2012).

There are two potential explanations for the inconsistency in these results. The first is that household income may not be a good and stable measure for capturing what children actually experience economically, since the intra-household distribution of resources cannot simply be assumed to be equal among household members (Phipps and Burton 1995; Dunbar et al. 2013). Poor children may exist in non-poor households and non-poor children may live in poor households (Main and Bradshaw 2012). Deprivation measures covering different aspects of children's lives are considered by some to be more accurate in reflecting the material conditions that children face and in which they live. Studies do show that child-derived deprivation measures are associated with the subjective wellbeing of children (Bradshaw et al. 2011; Main and Bradshaw 2012; Casas et al. 2013; Sarriera et al. 2015). Nevertheless, more analysis is desirable to further compare these two measures.

The second potential explanation for the inconsistencies in previous studies is that the relationship between poverty or income and the subjective wellbeing of children may not be as straightforward as one would expect especially in the presence of the mediation or moderation effects. A mediator is the mechanism through which an independent variable influences a dependent variable, while a moderator alters the direction or strength of the relationship between an independent variable and a dependent variable (Baron and Kenny 1986). It is, therefore, possible that that this relationship of poverty and subjective wellbeing is moderated by a third variable that yields a buffering effect or that poverty indirectly affects the subjective wellbeing of children through a mediator variable. For instance, qualitative findings suggest that parents, particularly mothers, try to protect their children from the effects of poverty by going without some things in order to provide more resources for their children (Ridge 2009). Also, children are aware of the effects of financial strain on their family's lives, with some expressing that it draws their families together (Willow 2001), while others

indicate tension with their parents (Hooper et al. 2007). The underlying mechanism of mediation or moderation is not well understood and thus is worth exploring.

Family and friend relationships could potentially be considered as mediator or moderator variables in the association between poverty and the subjective wellbeing of children. Such links are not yet certain, but various findings suggest a strong likelihood that these links exist. It has been shown, first, that economic status or financial strain affects relationships (Wadsworth and Compas 2002; Conger et al. 2002; Amato et al. 2009); second, that relationships are fundamental to a sense of wellbeing in children (Young et al. 1995; Nickerson and Nagle 2004; Suldo and Huebner 2004a, b; Carlsson et al. 2014); and third, that economic status affects child outcomes, though not specifically subjective wellbeing, through relationships (Odgers et al. 2012; Rijlaarsdam et al. 2013; Sun et al. 2015).

Given that the links between poverty and the subjective wellbeing of children are inadequately understood, this study explores the possible mechanisms of mediation and moderation with family relationships and friendships as the potential variables. Considering the availability of data, material deprivation of children was the measure of poverty used in this study, though it would have been ideal to employ both income and material deprivation as its measures.

The findings of this study have important implications. As Main and Bradshaw (2012) have noted, improving subjective wellbeing is increasingly regarded as a policy goal, given that it is known that an increase in GDP does not necessarily lead to an increase in wellbeing or happiness (Easterlin 1974). An understanding of what people need to feel satisfied with their lives and of how to meet these needs has become relevant in policy decisions and directions. What is shown is that there is no or a limited association between income poverty and children's life satisfaction, a finding that could justify putting less attention on improving poverty in this regard (Knies 2011). However, if the observed magnitude of the association is due to certain underlying mechanisms at work, we may have underestimated the effects of poverty and forgone the opportunity to take into account both poverty and other mediators or moderators as measures that could influence the subjective wellbeing of children.

The following pages will first provide a brief background discussion of the subjective wellbeing of children and the gaps in understanding the links between poverty and subjective wellbeing. Mediation and moderation analyses will be conducted by using family relationships and friendships as the mediators and moderators. Implications of the findings will be discussed.

## **2 Toward an Understanding of the Links between Poverty and Child Subjective Wellbeing**

### **2.1 From Wellbeing to Child Wellbeing**

The term wellbeing has been extensively used with different connotations. Broadly speaking, it often refers to people's quality of life (Rees et al. 2013), to the idea that something is in a good state (Veenhoven 2007), or simply to how well one's life is going. Despite the variations in the finer points of what constitutes a good state or high quality of life, it is generally agreed that wellbeing refers to both an objective state and to subjective experience (Veenhoven 2007; Huppert 2014).

An objective state of wellbeing refers to the factors of people's lives that occur at the societal level and that can be represented by indicators in different dimensions, such as education, health, housing, employment, and the environment. In terms of subjective experience, there are two approaches to wellbeing: hedonic and eudaimonic (Ryan and Deci 2001). Hedonic wellbeing further comprises affective and cognitive components, with the affective component referring to the balance of positive and negative emotions and the cognitive component referring to the global evaluation of life as a whole, reflecting life satisfaction, for example (Diener 1984; Ryan and Deci 2001). While hedonic approach to wellbeing focuses on the experience of being happy and feeling good, the eudaimonic approach is concerned with the experience of functioning well (Huppert 2014), focusing on, for example, how individuals engage in pursuing meaningful goals and on processes of self-actualization. For instance, using a eudaimonic view, Ryff (1989) developed a model of psychological wellbeing that comprised the dimensions of self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Hedonic and eudaimonic wellbeing can also be distinguished as subjective wellbeing and psychological wellbeing, respectively (Ryan and Deci 2001). Subjective wellbeing, and particularly its cognitive component, has drawn relatively more attention in the literature (Rees et al. 2013).

Research on child wellbeing is a relatively recent pursuit as compared to that on the wellbeing of adults. The late 1970s is generally considered to be the period when the child indicators movement began; that is, when child indicators were developed to monitor children's status. The late 1990s started to see the development of the international comparison of child wellbeing. A lot of progress has been made since then, including the refinement of the definition and measurement of child wellbeing in response to the pace of the changing world. The perception of child wellbeing has changed from one that was developmental in perspective to one that is rights-based in perspective (OECD 2009). The spectrum of indicators has evolved from those related to basic survival needs to those promoting child development, from those focused on negative to those focused on positive outcomes, from those reflecting the idea of wellbecoming to those reflecting that of wellbeing, from those that are limited to those that are multidimensional, and from those treating children as passive objects to those treating children as active subjects (Ben-Arieh 2008). Also, cross-national comparisons of child wellbeing had mostly been done on the western world (Bradshaw et al. 2007; UNICEF 2007; OECD 2009; UNICEF Office of Research 2013), but they have now expanded to include countries in Africa (UNICEF 2009; ACPF 2013) and in East and South-east Asia (Lau and Bradshaw 2010; Cho 2015). The ranking method, the most frequently adopted tool for comparison, has been complemented by the clustering approach, as well (Cho 2014).

## 2.2 Subjective Wellbeing of Children: Current Understanding and Gaps

Research on the subjective experience of children is less developed than is that on the objective state of child wellbeing, but it has recently been growing in importance and quantity. A number of studies have provided particular understanding about factors of

life satisfaction among children and youth, which can be summarized into several categories such as demographics, personality traits, health, disabilities, life stressors, risk-taking behaviors, and relationships (Proctor et al. 2009).

In terms of demographic characteristics, findings show that happiness or life satisfaction declines with age from childhood to adolescence (Rees et al. 2010; Klocke et al. 2014; Goswami 2014; Dinisman and Ben-Arieh 2016). While some findings show gender differences in subjective wellbeing (Bradshaw et al. 2011; Dinisman and Ben-Arieh 2016), some do not (Huebner et al. 2006). Some have suggested that gender differences could be more apparent when one takes into consideration specific domains of subjective wellbeing. For example, girls tend to have higher levels of subjective wellbeing when it comes to interpersonal relationships (Bradshaw et al. 2011). Also, most studies have found a non-significant or modest difference in happiness or life satisfaction depending on ethnicity (Gilman and Huebner 2003; Huebner et al. 2006; Bradshaw et al. 2011). Not living with both parents or living with relatives, non-relatives or guardians, a mother and another adult, or a father only are found to be negatively associated with subjective wellbeing (Zullig et al. 2005a; Goswami 2014; Pople et al. 2015).

Personality traits are related to the subjective wellbeing of children and adolescents (Rigby and Huebner 2005; Goswami 2014); emotional stability, for example, increases life satisfaction. Life satisfaction has been found to be related to poor physical and mental health and to activity limitation (Zullig et al. 2005b; Goswami 2014). Life stressors are associated with the life satisfaction of children. Acute stressors, which are episodic life events such as death of a family member and job loss of parent, or chronic stressors, which are ongoing daily negative experience such as family discord and living in poverty, are shown to be negatively related to life satisfaction (McCullough et al. 2000; Ash and Huebner 2001; Suldo and Huebner 2004a; Chappel et al. 2014; Moksnes and Haugan 2015). It has also been indicated that subjective wellbeing is negatively associated with various risk-taking behaviors, such as violence and running away (Valois et al. 2006; Rees 2011).

In terms of relationships, family and peer relationships have a strong association with subjective wellbeing. Positive family relationships, conversations with parents, and emotional and practical support from parents increase subjective wellbeing (Young et al. 1995; Nickerson and Nagle 2004; Suldo and Huebner 2004b; Carlsson et al. 2014), but family conflict and strict parenting decrease it (Van De Wetering et al. 2010). Having more close friends and peer attachment is positively related to subjective wellbeing (Nickerson and Nagle 2004; Carlsson et al. 2014), but being bullied has a negative effect on happiness (Carlsson et al. 2014).

In the last few years, a body of studies has examined the relationship between economic status, with household income employed as its measure, and the subjective wellbeing of children. Some have found a positive relationship, though it could be limited in magnitude (Rees et al. 2011; Rees et al. 2012), while others have shown no relationship (Knies 2011; Carlsson et al. 2014). There is a negative relationship between economic status and subjective wellbeing when child-derived material deprivation is used as the indicator (Bradshaw et al. 2011; Main and Bradshaw 2012; Rees et al. 2012; Casas et al. 2013). Other findings show that parental employment is associated with the subjective wellbeing of children. Children have a lower subjective wellbeing if living in a household where no one is employed or if their fathers are not

employed (Bradshaw et al. 2011; Klocke et al. 2014). Children who reported living with two employed adults at home had a higher subjective wellbeing (Casas et al. 2013). As mentioned, the relationship between economic status and child subjective wellbeing may not be that straightforward, and the link between the two has yet to be explored. As described by the Easterlin paradox (Easterlin 1974), an increase in wealth may not necessarily lead to an increase in happiness, at least once a certain threshold of wealth has already been met. And as noted in the review by Cooper and Stewart (2013), income may have a stronger effect on poorer children than it does on other children. There may also be possible mediation or buffering in this link, as suggested by Cummins (2000).

### 2.3 Relationships as Possible Links

Relationships with family and friends could be potential mediators or moderators of poverty on subjective wellbeing. Such a link is possible, as suggested by empirical evidence: economic strain affects relationships, relationships are important to a sense of wellbeing of children, and relationships are significant factors that mediate or moderate the influence of poverty, though not subjective wellbeing, on child outcomes.

Findings show that economic hardship may cause family stress and conflict (Wadsworth and Compas 2002; Conger et al. 2002; Amato et al. 2009). While it is generally unquestionable whether family relationships and friendships are the most influential proximal contexts for children, the importance of family and peer relationships to children's subjective wellbeing is also well supported, as discussed above. There are also a number of studies demonstrating that the negative effects of economic circumstances on child outcomes may be mediated or buffered by relationships (Malecki and Demaray 2006; Ashiabi and O'Neal 2007; Gonzales et al. 2011; Odgers et al. 2012; Rijlaarsdam et al. 2013; Perkins et al. 2013; Sun et al. 2015). In these studies, economic circumstances have included income poverty, material deprivation, and perceived economic hardship. Relationships have included friendships, which reflect peer support and pressure, and family relationships, which represent parenting behavior, parental warmth, and parent-child relationships. The range of child outcomes that have been affected by these relationships includes health status, academic performance, psychiatric symptoms, self-esteem, anti-social behavior, and internalizing and externalizing problems. It appears reasonable to expect that the subjective wellbeing of children could be affected in a similar manner.

Based on the above findings, this study aims to explore the possible role of family relationships and friendships as mediators or moderators in the relationship between poverty and subjective wellbeing of children. The hypotheses of this study are:

- (i). Family relationships mediate the effect of material deprivation of children on the subjective wellbeing of children,
- (ii). Friendship mediates the effect of material deprivation of children on the subjective wellbeing of children,
- (iii). Family relationships moderate the effect of material deprivation of children on the subjective wellbeing of children, and
- (iv). Friendship moderates the effect of material deprivation of children on the subjective wellbeing of children.

### 3 Methods

#### 3.1 Data

Data for this study came from The Children's Society's second wellbeing survey, conducted from 2010 to 2011, which included a representative sample of about 6000 children aged eight to 15 who were in schools in England (Rees et al. 2012). There were different versions of the questions utilized in the survey. The version most relevant to the present study included approximately 1900 children aged ten to 15. The final sample, those who have responded to the questions related to the variables used in the study, consisted of a total of 1569 children aged 10 to 15 who were in grades 6, 8, and 10.

#### 3.2 Variables

In this study, child deprivation and subjective wellbeing were the independent and dependent variables, respectively. Family relationships and friendships were the potential mediator and moderator variables. Various socioeconomic variables were also included as control variables.

##### 3.2.1 Child Deprivation

Child deprivation was measured by asking children 10 questions about their material possessions and the existence of particular opportunities in their lives of material condition (Main and Bradshaw 2012). The children were asked whether they had the following: (1) some pocket money each week to spend on yourself; (2) some money that you can save each month, either in a bank or at home; (3) a garden at home, or somewhere nearby like a park where you can safely spend time with your friends; (4) a family car for transport when you need it; (5) at least one family holiday away from home each year; (6) family trips or days out at least once a month; (7) the right kind of clothes to fit in with other people your age; (8) a pair of designer or brand-name trainers; (9) an iPod or other personal music player; and (10) cable or satellite TV at home.

Responses to the items included: (1) I have this, (2) I don't have this but I would like it, and (3) I don't have this and I don't want or need it. By summing the number of items that children did not have and wanted (i.e., response (2)), a deprivation score was obtained, with a score of zero referring to no deprivation and one of 10 indicating the highest level of deprivation. Cronbach's Alpha was previously reported to be 0.72 (Main and Bradshaw 2012), and it was 0.73 in this study, indicating an acceptable level of internal consistency (Nunnally 1978).

##### 3.2.2 Subjective Wellbeing

There were three different measures of overall subjective wellbeing, with one asking about happiness with life as a whole and the other two about overall life satisfaction (Rees et al. 2010).

Happiness with life as a whole was measured by the overall question of "how happy are you with your life as a whole?" This question was derived from Cummins and Lau (2005) and had an 11-point scale ranging from zero to 10 (0 = *very unhappy*, 5 = *not*

*happy or unhappy*, 10 = *very happy*). When the test-retest reliability of the question was assessed, the intraclass correlation was found to be 0.63 ( $p < 0.001$ ), indicating moderate reliability (Rees et al. 2010).

Cantril's ladder was used as a measure of overall life satisfaction. Cantril's ladder is an 11-point scale that asks people, in this case children, to rate their quality of life (using the metaphor of where they stand on a ladder) from zero to 10 (0 = *the worst possible life*, 10 = *the best possible life*). The intraclass correlation coefficient was 0.59 ( $p < 0.001$ ), indicating moderate reliability (Rees et al. 2010). Other test-retest analyses also showed acceptable agreement with Pearson's correlations in the range of 0.66 and 0.70 for 11- and 13-year-old children (Levin and Currie 2014).

The five-item version of the Students' Life Satisfaction Scale (SLSS5), based on its earlier version (Huebner 1991), is another measure of overall life satisfaction that was used in this study. It includes five statements: (1) my life is going well, (2) my life is just right, (3) I wish I had a different kind of life, (4) I have a good life, and (5) I have what I want in life. Children responded to each statement using a five-point scale (0 = *strongly disagree*, 4 = *strongly agree*). The negative item (3) was reverse coded. The overall score was the sum of all the item scores and ranged from zero to 20. The reliability of this scale was good. The intraclass correlation coefficient was found to be 0.84 ( $p < 0.001$ ) (Rees et al. 2010). Cronbach's alpha was 0.80 for a sample of Spanish children (Casas et al. 2013), and it was 0.86 for the sample of this study.

### 3.2.3 Family Relationships and Friendships as Moderators or Mediators

Family relationship was measured by the views of children about the general quality of their family relationships and relationships with their parents. There were five statement used: (1) I enjoy being at home with my family, (2) my family gets along well together, (3) my parents listen to my views and take me seriously, (4) my parents treat me fairly, and (5) my parents and I do fun things together. Responses to the statements were based on a five-point scale ranging from zero to four (0 = *strongly disagree*, 4 = *strongly agree*). Responses were summed to produce a total score ranging from zero to 20. The higher the score, the happier children were with their family relationships. Cronbach's alpha was reported at 0.89 in both Main's (2014) and in this study, indicating good internal consistency.

Friendship refers to the quality of friendships, which was measured by eight items: (1) my friends treat me well, (2) I feel safe when I am with my friends, (3) I wish I had different friends, (4) my friends are mean to me, (5) my friends are great, (6) I have a bad time with my friends, (7) I have a lot of fun with my friends, and (8) my friends will help me if I need it. Children responded to each item using a five-point scale that ranged from zero to four (0 = *strongly disagree*, 4 = *strongly agree*). The negative items (3), (4), and (6) were reverse coded. Summing all item scores produced an overall score ranging from zero to 32. The higher the score, the happier children were with their friendships. Cronbach's alpha was 0.84 for the sample of this study, indicating good internal consistency.

### 3.2.4 Control Variables

Various socioeconomic variables were included as control variables. Sex of the child was a dichotomous measure (1 = *female*, 0 = *male*). Year in school included years six, eight, and ten, with year six being the reference category. Type of family referred to



whether the child was part of a two-parent family, a single-parent family, or a step- or other type of family, with the two-parent family being the reference group. For subjective health status, children were asked to rate their health using a five-point scale that ranged from zero to four (0 = *very bad*, 1 = *bad*, 2 = *fair*, 3 = *good*, 4 = *very good*). An overall score ranging from zero to 32 was obtained by summing the item scores. Last, learning difficulties were measured by asking children, “would you say that you have difficulties with learning?” The response was either “yes” or “no”, with “no” being the reference category.

### 3.3 Analysis

This study used multiple mediation and multiple moderation models, based on regression analyses, to test the possible mediating and moderating effects, respectively, of family relationships and friendships on the relationship between child deprivation and subjective wellbeing, controlling for various background variables. Family relationships and friendships, operating in parallel without affecting one another, were simultaneously examined in the models. The PROCESS macro developed by Hayes (2013) was used for the estimations.

Three different multiple mediation analyses were conducted for happiness with life as a whole, Cantril’s ladder, and SLSS5 to estimate the direct, indirect, and total effects of child deprivation on subjective wellbeing. The indirect effect is the part of the child deprivation effect that is mediated by the set of mediators. As further shown from the paths in Fig. 1, the specific indirect effect is the mediating effect of a particular mediator,  $(a_1 \times b_1)$  or  $(a_2 \times b_2)$ , while the total indirect effect is the aggregate of the mediating effects of all mediators,  $(a_1 \times b_1) + (a_2 \times b_2)$ . The direct effect is the part of the child deprivation effect that is not mediated by the set of mediators ( $c'$ ). The total effect is the aggregate of both the indirect and direct effects ( $c$ ), which is also denoted as  $(a_1 \times b_1) + (a_2 \times b_2) + c'$ . Bootstrapping, as a non-parametric sampling procedure, was

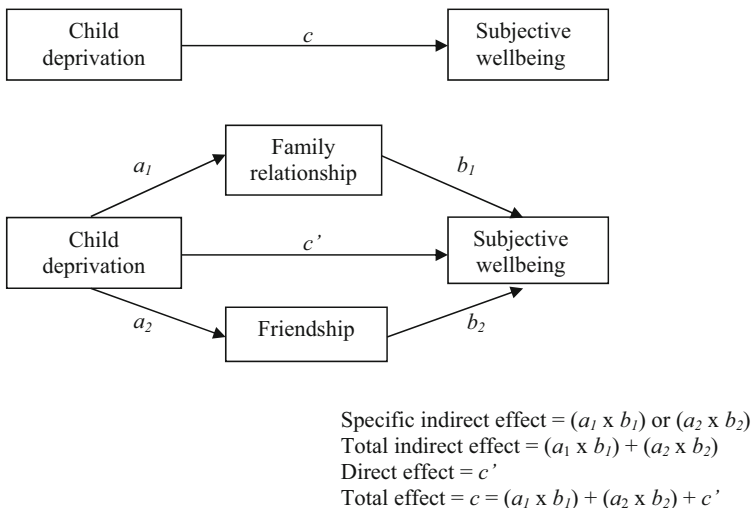


Fig. 1 Paths showing different effects in the multiple mediation model

used to test the significance of the indirect effect. It is considered statistically robust as it does not assume normality in the sampling distribution (Preacher and Hayes 2008). The 95% bias-corrected and accelerated bootstrap confidence intervals were calculated using 5000 bootstrap samples. Results are statistically significant when the confidence intervals do not include zero (Preacher and Hayes 2008).

Three different multiple moderation analyses were implemented to test whether there was a differential effect of child deprivation on subjective wellbeing as a function of family relationships and friendships. In each analysis, the mean-centered products of child deprivation and each of the moderators were included as the interaction terms, (child deprivation  $\times$  family relationship) and (child deprivation  $\times$  friendship). With mean centering, the mean is subtracted from each value of the variables so that the new mean becomes zero, avoiding problems associated with multicollinearity in an analysis (Frazier et al. 2004). If the interaction is significant, suggesting the presence of moderation, simple slope tests are then conducted to examine the conditional effect of child deprivation on subjective wellbeing at the average (mean), high (one standard deviation above the mean), and low (one standard deviation below the mean) levels of the moderator (Aiken and West 1991).

## 4 Findings

Table 1 reports the descriptive statistics and correlations of variables. The sample for this study had approximately equal distribution between sexes, had slightly more children in year eight in school, and was mainly represented by children with two-parent families and with no learning difficulties. Child deprivation was significantly and negatively associated with all mediators and moderators and all variables of subjective wellbeing. Being female had a slight negative association with family relationship, subjective health status, and subjective wellbeing, but it had a positive relationship with friendship. The higher the year of school a child was in, the less satisfied he or she was in terms of relationships with family and friends, and the lower was his or her subjective wellbeing. Learning difficulties were positively related to deprivation and negatively related to relationships, subjective wellbeing, and subjective health status.

### 4.1 Relationships as Mediators

Tables 2, 3 and 4 show that the multiple mediation models of child deprivation on happiness with life as a whole ( $F(10, 1558) = 100.65, p < 0.001$ ), Cantril's ladder ( $F(10, 1558) = 92.77, p < 0.001$ ), and Huebner's SLSS5 ( $F(10, 1536) = 166.82, p < 0.001$ ) explains 39%, 37%, and 52% of the overall variance respectively. Child deprivation was negatively associated with happiness with life as a whole ( $b = -0.23, p < 0.001$ ), Cantril's ladder ( $b = -0.23, p < 0.001$ ) and SLSS5 ( $b = -0.45, p < 0.001$ ) after controlling for covariates. Child deprivation had a significant negative effect on family relationship ( $b = -0.67, p < 0.001$ ) and friendship ( $b = -0.38, p < 0.001$ ) with approximately the same magnitudes in all three models. Family relationship and friendship positively affected happiness with life as a whole ( $b = 0.21, p < 0.001$  and  $b = 0.06, p < 0.001$ , respectively), Cantril's ladder ( $b = 0.18, p < 0.001$  and  $b = 0.06, p < 0.001$ , respectively), and SLSS5 ( $b = 0.50, p < 0.001$  and  $b = 0.15, p < 0.001$ , respectively).

**Table 1** Descriptive statistics and correlations of variables

	Mean (SD) or %	1	2	3	4	5	6	7	8	9	10
1. Child deprivation	1.18 (1.68)	-									
2. Family relationship	15.33 (4.05)		-0.36**								
3. Friendship	26.29 (4.84)			-0.21**							
4. Happiness with life as a whole	7.73 (2.06)				-0.28**						
5. Cantril's ladder	7.65 (1.84)					-0.30**					
6. Huebner's SLSS5	14.68 (3.89)						-0.30**				
7. Subjective health status	10.46 (3.07)							-0.24**			
8. Sex									-0.10		
1 = Female	45									0.14	
0 = Male	55										0.11*
9. Year in school											
6	29										
8	39										
10	32										
10. Learning difficulties											
1 = Yes	11										
0 = No	89										
11. Family type											
Two-parent	69										
Single-parent	20										
Step & others	11										

\* $p < 0.05$ , \*\* $p < 0.01$

**Table 2** Multiple mediation analysis of child deprivation on happiness with life as a whole

	Coefficient	SE	t	95% CI
Total effect ( <i>c</i> )	-0.231	0.028	-8.216***	
Direct effect				
Child deprivation on happiness with life as a whole ( <i>c'</i> )	-0.067	0.027	-2.522*	
Child deprivation on mediators				
Family relationship ( <i>a</i> <sub>1</sub> )	-0.665	0.053	-12.660***	
Friendship ( <i>a</i> <sub>2</sub> )	-0.375	0.070	-5.372***	
Mediator on happiness with life				
Family relationship ( <i>b</i> <sub>1</sub> )	0.214	0.012	17.455***	
Friendship ( <i>b</i> <sub>2</sub> )	0.057	0.009	6.164***	
Controls				
Gender (reference = male)	-0.135	0.083	-1.620	
Year in school (reference = year 6)				
8	-0.221	0.102	-2.166*	
10	-0.024	0.113	-0.214	
Type of family (reference = two-parent)				
Single-parent	-0.160	0.104	-1.540	
Step & others	-0.335	0.135	-2.490*	
Health	0.126	0.016	8.160***	
Learning difficulties (reference = no)	0.034	0.131	0.257	
Indirect effect of child deprivation through				
Family relationship ( <i>a</i> <sub>1</sub> x <i>b</i> <sub>1</sub> )	-0.143	0.017		-0.177, -0.111
Friendship ( <i>a</i> <sub>2</sub> x <i>b</i> <sub>2</sub> )	-0.021	0.006		-0.036, -0.011
Total (all <i>a</i> x <i>b</i> )	-0.164	0.018		-0.201, -0.129
Model summary	$R^2 = 0.393, F(10, 1558) = 100.651***$			

Bias corrected and accelerated 95% confidence interval; 5000 bootstrap samples

Letter in parentheses indicates path in the model

\*  $p < 0.05$ , \*\*\* $p < 0.001$

Moreover, the indirect effect of child deprivation on happiness with life, Cantril’s ladder, and SLSS5 through family relationship ( $b = -0.14, SE = 0.02, CI[-0.18, -0.11]$ ;  $b = -0.12, SE = 0.02, CI[-0.15, -0.09]$ ; and  $b = -0.33, SE = 0.04, CI[-0.41, -0.26]$ , respectively) and friendship ( $b = -0.02, SE = 0.01, CI[-0.04, -0.01]$ ;  $b = -0.02, SE = 0.01, CI[-0.04, -0.01]$ ; and  $b = -0.06, SE = 0.02, CI[-0.09, -0.03]$ , respectively) was significant, as the 95% bias-corrected and accelerated confidence intervals did not contain zero. The direct effect of child deprivation on happiness with life as a whole and Cantril’s ladder remained significant but small ( $b = -0.07, p < 0.05$  and  $b = -0.09, p < 0.001$ , respectively) while it became insignificant on SLSS5. Thus, the effect of child deprivation was shown to be largely mediated by the relationship variables, especially by family relationship. The path diagrams of the models are shown in Fig. 2a–c.

### 4.2 Relationships as Moderators

The interactions were found to be significant only in the models of happiness with life as a whole and SLSS5, indicating the presence of moderating effect in these models. Tables 5 and 6 show that the model of happiness with life as a whole ( $F(12, 1556) = 80.910, p < 0.001$ ) and the model of SLSS5 ( $F(12, 1534) = 122.881, p < 0.001$ ) accounts for 40% and 52% of variance respectively. The interaction of child deprivation with family

**Table 3** Multiple mediation analysis of child deprivation on Cantril's ladder

	Coefficient	SE	t	95% CI
Total effect ( <i>c</i> )	-0.233	0.025	-9.233***	
Direct effect				
Child deprivation on Cantril's ladder score ( <i>c'</i> )	-0.093	0.024	-3.865***	
Child deprivation on mediators				
Family relationship ( <i>a</i> <sub>1</sub> )	-0.665	-0.053	-12.660***	
Friendship ( <i>a</i> <sub>2</sub> )	-0.375	0.070	-5.372***	
Mediator on Cantril's ladder score				
Family relationship ( <i>b</i> <sub>1</sub> )	0.180	0.011	15.806***	
Friendship ( <i>b</i> <sub>2</sub> )	0.061	0.008	7.279***	
Controls				
Gender (reference = male)	-0.107	0.076	-1.412	
Year in school (reference = year 6)				
8	-0.044	0.092	-0.477	
10	-0.013	0.103	-0.902	
Type of family (reference = two-parent)				
Single-parent	-0.234	0.094	-2.478*	
Step & others	-0.148	0.122	-1.213	
Health	0.092	0.014	6.554*	
Learning difficulties (reference = no)	-0.247	0.119	-2.077*	
Indirect effect of child deprivation through				
Family relationship ( <i>a</i> <sub>1</sub> × <i>b</i> <sub>1</sub> )	-0.117	0.015		-0.147, -0.089
Friendship ( <i>a</i> <sub>2</sub> × <i>b</i> <sub>2</sub> )	-0.023	0.006		-0.038, -0.012
Total (all <i>a</i> × <i>b</i> )	-0.140	0.016		-0.173, -0.110
Model summary			$R^2 = 0.373$ , $F(10, 1558) = 92.768$ ***	

Bias corrected and accelerated 95% confidence interval; 5000 bootstrap samples

Letter in parentheses indicates path in the model

\* $p < 0.05$ , \*\*\* $p < 0.001$

relationship was significant in both models ( $b = 0.016$ ,  $SE = 0.01$ ,  $CI[0.005, 0.028]$ ;  $b = 0.027$ ,  $SE = 0.01$ ,  $CI[0.009, 0.045]$ , respectively), but the one with friendship was not. Figures 3 and 4 show that the association between child deprivation and life happiness or SLSS5 score varied by the satisfaction levels of family relationship. A similar pattern could be found across different satisfaction levels of friendship. High levels of family relationship, or a good family relationship, were associated with greater happiness or high SLSS5 scores, even with high levels of child deprivation. In contrast, there was a negative effect of child deprivation on happiness or SLSS5 when family relationship was at average or low levels, with a greater impact for low-level family relationships.

However, simple slopes tests showed that the relationship between child deprivation and happiness with life as a whole or SLSS5 was only significant when family relationship was at a low level (In happiness with life as a whole:  $b = -0.093$ ,  $p < 0.01$  for low friendship;  $b = -0.099$ ,  $p < 0.01$  for average friendship;  $b = -0.105$ ,  $p < 0.05$ , for high friendship. In SLSS5:  $b = -0.124$ ,  $p < 0.05$  for average friendship;  $b = -0.161$ ,  $p = 0.055$  for high friendship).

## 5 Discussion

This study fills a gap in the literature by exploring the possible links between poverty and the subjective wellbeing of children. As hypothesized, family relationships and

**Table 4** Multiple mediation analysis of child deprivation on Huebner's SLSS5

	Coefficient	SE	t	95% CI
Total effect ( <i>c</i> )	-0.447	0.052	-8.588***	
Direct effect				
Child deprivation on SLSS5 ( <i>c'</i> )	-0.060	0.045	-1.351	
Child deprivation on mediators				
Family relationship ( <i>a<sub>1</sub></i> )	-0.653	0.053	-12.389***	
Friendship ( <i>a<sub>2</sub></i> )	-0.381	0.070	-5.441***	
Mediator on SLSS5				
Family relationship ( <i>b<sub>1</sub></i> )	0.503	0.021	24.175***	
Friendship ( <i>b<sub>2</sub></i> )	0.152	0.016	9.731***	
Controls				
Gender (reference = male)	-0.118	0.141	-0.841	
Year in school (reference = year 6)				
8	-0.068	0.172	-0.395	
10	-0.029	0.191	-0.150	
Type of family (reference = two-parent family)				
Single-parent	-0.633	0.175	-3.608***	
Step & others	-0.437	0.227	-1.922*	
Health	0.191	0.026	7.328***	
Learning difficulties (reference = no)	-0.132	0.222	-0.594	
Indirect effect of child deprivation through				
Family relationship ( <i>a<sub>1</sub> x b<sub>1</sub></i> )	-0.328	0.037		-0.405, -0.260
Friendship ( <i>a<sub>2</sub> x b<sub>2</sub></i> )	-0.058	0.016		-0.093, -0.032
Total (all <i>a x b</i> )	-0.387	0.042		-0.470, -0.308
Model summary	$R^2 = 0.521, F(10,1536) = 166.817***$			

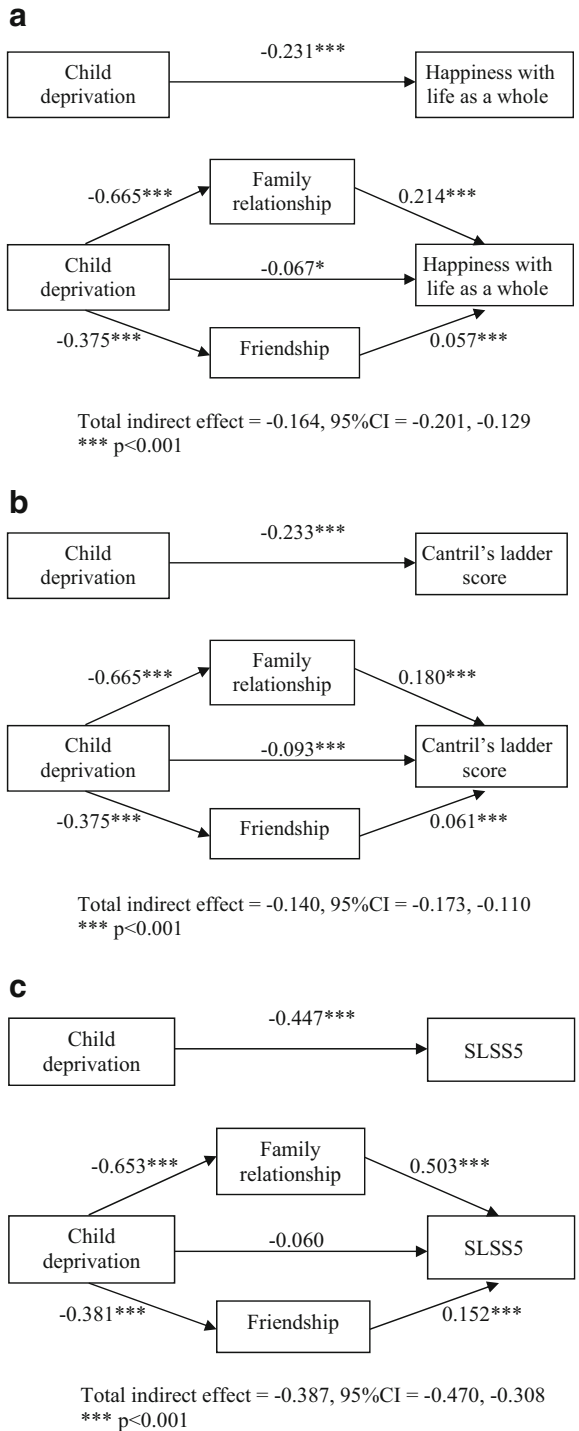
Bias corrected and accelerated 95% confidence interval; 5000 bootstrap samples

Letter in parentheses indicates path in the model

\* $p < 0.05$ , \*\*\* $p < 0.001$

friendships are significant mediators in the relationship between child deprivation and subjective wellbeing. The direct effect of child deprivation becomes insignificant or decreases in magnitude when these two mediators are included in the analyses. In the moderation analyses, family relationship is a moderator only in the models of happiness with life as a whole and SLSS5. However, it is not significant when family relationship is good or average, wherein a strong association can be found between even children who are highly deprived and high subjective wellbeing. It is only significant when family relationships are not that good—the happiness and life satisfaction of children are much deteriorated when they are more deprived.

These findings provide information to address the issue of inconsistent results in prior studies of poverty and subjective wellbeing of children. First, it has been suggested that deprivation measures are likely to be more accurate than income to represent the poverty experience of children (Main and Bradshaw 2012). Although this study does not compare the two measures, it has provided one more piece of evidence that child deprivation is associated with the decreased levels of subjective wellbeing. Second, as discussed, the association between poverty and subjective wellbeing may not be as straightforward as anticipated. Based on the findings of this study, it is shown that the effect of child deprivation on subjective wellbeing operates indirectly and particularly through family relationships. This is in line with previous results that poverty may cause family stress and conflict (Amato et al. 2009). As constant financial worries and struggle to make ends meet



**Fig. 2** Path diagrams showing the multiple mediation models of child deprivation on subjective wellbeing. (a) Happiness with life as a whole, (b) Cantril's ladder, (c) Huebner's SLSS5

**Table 5** Multiple moderation analysis of child deprivation on happiness with life as a whole

Variable	Coefficient	SE	t	95% CI
Constant	6.651	0.228	29.153***	[6.203, 7.098]
Child deprivation	-0.034	-0.030	-1.136	[-0.094, 0.025]
Family relationship	0.207	0.014	14.574***	[0.180, 0.235]
Friendship	0.060	0.011	5.635***	[0.039, 0.081]
Child deprivation x family relationship	0.016	0.006	2.732**	[0.005, 0.028]
Child deprivation x friendship	-0.001	0.005	-0.246	[-0.011, 0.009]
Controls				
Gender (reference = male )	-0.140	0.086	-1.622	[-0.309, 0.029]
Year in school (reference = year 6)				
8	-0.218	0.102	-2.145*	[-0.418, -0.019]
10	-0.026	0.115	-0.224	[-0.252, 0.200]
Type of family (reference = two-parent)				
Single-parent	-0.155	0.111	-1.396	[-0.373, 0.063]
Step & others	-0.320	0.139	-2.307*	[-0.591, -0.048]
Health	0.127	0.017	7.484***	[0.094, 0.161]
Learning difficulties (reference = no)	0.044	0.167	0.265	[-0.283, 0.371]
Model summary	$R = 0.630, R^2 = 0.396, F(12, 1556) = 80.910***$			

\*  $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

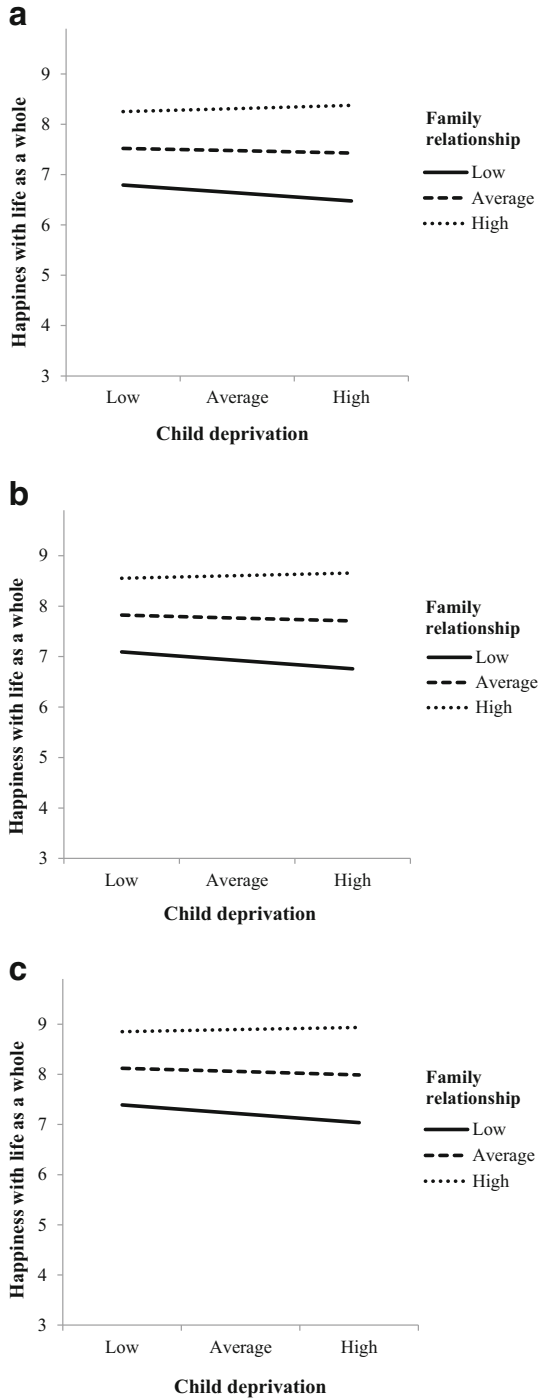
can take a toll on parents, physically and mentally, parental or family conflict may increase while quality time for family interaction may decrease. Though family relationship is not a significant moderator when it is at good or average level, the negative impacts of deprivation are especially exacerbated when a family relationship is not going well. This reflects that family relationships have protective function, as having an average or good relationship may at least prevent the further deterioration of subjective wellbeing. This is

**Table 6** Multiple moderation analysis of child deprivation on SLSS5

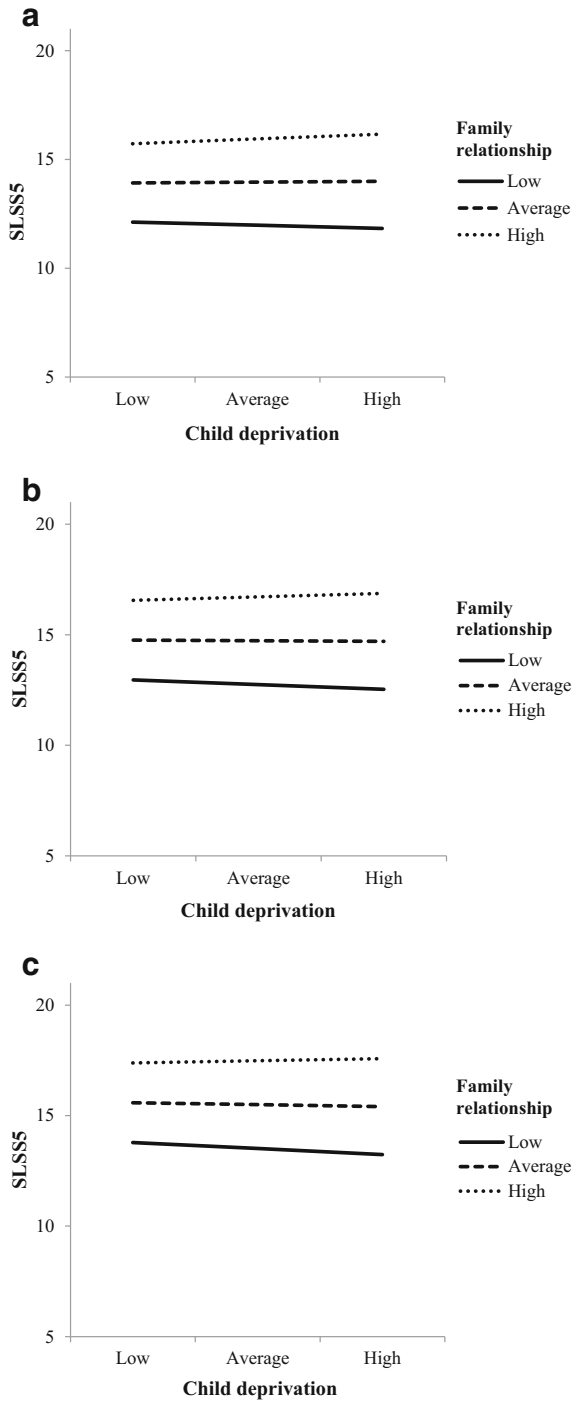
Variable	Coefficient	SE	t	95% CI
Constant	12.975	0.384	33.773***	[12.221, 13.728]
Child deprivation	-0.015	0.051	-0.299	[-0.116, 0.086]
Family relationship	0.490	0.024	20.75***	[0.444, 0.536]
Friendship	0.160	0.019	8.439***	[0.123, 0.197]
Child deprivation x family relationship	0.027	0.009	2.890**	[0.009, 0.045]
Child deprivation x friendship	-0.008	0.009	-0.880	[-0.025, 0.009]
Controls				
Gender (reference = male )	-0.132	0.143	-0.920	[-0.413, 0.149]
Year in school (reference = year 6)				
8	-0.064	0.172	-0.374	[-0.401, 0.273]
10	0.029	0.196	0.150	[-0.356, 0.415]
Type of family (reference = two-parent)				
Single-parent	-0.619	0.196	-3.158**	[-1.004, -0.235]
Step & others	-0.407	0.222	-1.836	[-0.842, 0.028]
Health	0.193	0.029	6.705***	[0.136, 0.249]
Learning difficulties (reference = no)	-0.119	0.266	-0.447	[-0.641, 0.403]
Model summary	$R = 0.724, R^2 = 0.524, F(12, 1534) = 122.881***$			

\*\* $p < 0.01$ , \*\*\* $p < 0.001$





**Fig. 3** Effects of child deprivation and family relationship on happiness with life as a whole, by levels of friendship. (a) Low level of satisfaction toward friendship, (b) Average level of satisfaction toward friendship, (c) High level of satisfaction toward friendship



**Fig. 4** Effects of child deprivation and family relationship on SLSS5, by levels of friendship. (a) Low level of satisfaction toward friendship, (b) Average level of satisfaction toward friendship, (c) High level of satisfaction toward friendship

consistent with prior qualitative findings that a close parent-child relationship, in which parents put children's needs before their own (Ridge 2009), may mitigate the negative impacts of poverty on children.

Taken together, the findings of this study have policy and research implications. If life satisfaction or happiness of children is a policy goal to achieve, improvement of economic security of families and strengthening of family relationships could be emphasized as strategies. For instance, it is of great importance to have a balance of policy measures that are supportive of a nurturing family environment, in which families can obtain a level of economic stability without financial stress and parents can spend time to establish quality relationship with their children. Findings do show that spending time with family, such as in everyday leisure activities, is related to family cohesion (Zabriskie and McCormick 2001). To increase family earnings, one way is to encourage parental employment, through tax breaks as incentives or child care support to reduce barriers to employment, given that jobs with decent pay are available. Another way is to subsidize the costs of rearing children (Waldfogel 2004), through child-related cash transfers such as child allowance and income assistance for single-parent families. A raise in family income could have a particular impact on families at the bottom of the income ladder. To increase quality time with children, time benefits, such as parental leaves, can allow parents to stay out of employment and spend time with their children (Waldfogel 2004), especially when children are very young or sick, while labor force attachment is maintained. Work-life balance measures, such as flexibility in work time or work place, could also help parents to reconcile employment and spending time with children.

Different countries may have adopted a mix of these policies or measures. However, the intention of encouraging a nurturing family environment for children or of putting children's happiness on high priority may not be clearly introduced into the policy agenda. In some countries, parental employment may be encouraged while efforts to remove employment barriers or to support time spent with children, through child care or parental leave, are limited (Cho 2016). Some countries could be generous in parental leaves, yet a prolonged leave could serve as a disincentive to employment (Ruhm 2011). To strengthen family relationship as a whole, relevant policy measures, including parental leaves and child care, should be compatible with each other and need to be considered as a package in design.

The limitations of this study may serve as directions for future research. While the measures of material deprivation employed in this study may have high relevance to the western developed countries, they may not necessarily bear the same level of importance in other countries or cultures. The experience of poor children in the affluent countries could be different from that of poor children in the impoverished countries. The material items that are considered essential in one culture may not be relevant to the others. The results of this study, thus, should be interpreted cautiously for the less developed countries or other non-western cultural contexts. Future studies may aim to investigate whether there are different sets of mechanisms between poverty and subjective wellbeing of children in different countries or cultural backgrounds.

Also, this study only employs material deprivation of children as measures of poverty. Current data does not allow household income, child deprivation, and relationships to be included in one study. But this study at least provides an initial understanding that the relationship between child deprivation and subjective wellbeing is not straightforward and

that underlying mechanisms for that relationship do exist. As the current findings on the association of income and subjective wellbeing are very inconsistent, it is expected that the links between the two may be more sophisticated and worth further investigation. In future research, it would be desirable to consider both household income and child deprivation measures, when data is available, in order to gain a fuller understanding of the links between poverty and the subjective wellbeing of children.

## 6 Conclusion

This study explored the possible links between child deprivation and the subjective wellbeing of children. Multiple mediation and multiple moderation analyses were conducted to examine the role of family relationships and friendships as possible mediators and moderators. Results show that the effect of child deprivation on the happiness and life satisfaction of children is mediated by family relationships, particularly, and friendships. It was also found that family relationships are a significant moderator, especially the negative impact of child deprivation on subjective wellbeing can be made worse if family relationships are not going well. This suggests that good family relationships may prevent further deterioration of subjective wellbeing. Policy measures that aim to promote the subjective wellbeing of children could focus on strengthening the family relationship or nurturing home environment through supporting the economic security of households with children and parental time with children.

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