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Do households prioritise children? Intra-household deprivation a case study of the South Pacific

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Abstract

The literature suggests that pattern of intra-household inequality are context specific: while some find that households prioritise children (Main and Bradshaw, 2016), others find that children are more likely to experience the consequences of poverty (Brown et al., 2018a) suggesting that intra-household inequalities are context specific. In Tonga, the high value of children, role of women in decision making and low extreme poverty rates suggest that households will prioritise children. However, the data does not match this expectation. Where possible households share resources equally. In contexts of low resources, both adults and children may be prioritised. This article builds on the methodology developed by Main and Bradshaw to provide the first analysis of intra-household inequalities between children and adults in the South Pacific. It argues that deprivation patterns are shaped both by household decisions on resource allocation and by wider access to resources. The approach used can be applied in other contexts to explore deprivation patterns and inform anti-poverty strategies. The article contributes to the growing literature on intra-household inequalities between children and adults.

1. Introduction

Poverty is often measured at the household level as households tend to share both resources (e.g. earnings, farming produce) and expenses. Under this model children living in poor or deprived households are themselves categorised as poor. For instance, Mood and Jonsson (2016, p. 827) define child poverty as "a lack of economic resources – stemming from the household's economy or their own - that prevents children from participating as equals in social life". The decision to measure poverty at the household level relies on two assumptions that have been identified as problematic a) that household level indicators are a good reflection of the standards of living of both children and adults, and b) that resources are evenly shared among household members. With regards to the first assumption, it is increasingly recognised that children have specific needs compared with adults e.g. in terms of education, nutrition and so on (Minujin and Nandy, 2012; Delamonica, 2014). Since the needs of children and adults are different, their living standards can also be different even within households with equal sharing of resources (Gordon and Nandy, 2012; Guio et al., 2017). Furthermore, there is increasing evidence of unequal access to resources within households (Klasen and Lahoti, 2016; de Vreyer and Lambert, 2018). If the assumption of equal sharing of resources is violated, then the estimates produced by household measures will be biased, that is, some children who are poor will be identified as not poor, and the reverse, resulting in a mis-estimation of poverty rates. Ignoring intra-household deprivation dynamics can also potentially result in a misdirection of resources, as in order to effectively direct resources to the most vulnerable, policy makers rely on the correct identification of the poor.

Thus, specific indicators are needed to measure poverty and deprivation among the child population. The Sustainable Development Goals (SDGs) have encouraged countries to produce estimates that assess the wellbeing of children, men and women separately, using multidimensional measures. For instance, SDG 1.2 states the aim to "reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions". Similarly, the European Union has recently deployed a child specific material deprivation index (Guio et al., 201; 20187). Child specific indicators are fundamental to accurately assess children's access to rights.

The findings of the intra-household inequality literature indicate that the intra-household allocation of resources is context specific, shaped both by household characteristics and the wider context. Thus, there is a need for research that explores intra-household variations in different contexts. This paper presents the first study on intra-household inequalities between children and adults in the South Pacific. Using data from a consensual deprivation module included the Tongan Household Income and Expenditure Survey (2015/16) addresses two key research questions: Are there intra-household inequalities in deprivation in Tonga? Do households prioritise children? In doing so, it contributes to the debates on intra-household inequality across contexts. Additionally, the paper extends the approach proposed by Main and Bradshaw (2016) to explore intra-household deprivation by examining variations in deprivation patterns across domains. Designing appropriate policy responses to child deprivation requires identifying not only how many children are deprived and how they fare in comparison to adults, but also what forms of deprivation they experience. The analysis of deprivation patterns can be used to identify priorities for policy action (e.g. food, education, etc) and allows for a better understanding of decision-making processes within households.

The paper is structured as follows. Section 2 reviews the literature on child poverty measurement and intra-household inequalities. Section 3 introduces the local context in Tonga. Section 4 explains the approach, data and measures used. The findings are presented in Section 5. Section 6 discusses the implications of the findings for both policy and further research.

2. Child poverty and deprivation

2.1 Measuring child poverty and deprivation

Poverty is widely understood as inadequate command over resources (Townsend, 1979). The poor are thus those whose resources are so low that this affects their ability to participate in the society in which they live. One of the most widely used approaches to identify the poor are income-based measures (e.g. the World-Bank 'dollar a day', or European relative At Risk of Poverty threshold). However, income-based measures do not allow distinguish how resources are allocated within households (Qi and Wu, 2019). Those interested in analysing variations within households have analysed either expenditure or outcomes (e.g. nutritional outcomes, access to food and non-food items, see De Vreyer and Lambert 2018; Brown et al., 2018a; Abe, 2018). The analysis of expenditures requires the collection of data on how household income is spent, allocating each expense to a household member, usually through expenditure diaries. Both income and expenditure measures obscure the significance of welfare services and facilities on children's outcomes (Qi and Wu, 2019). Child well-being is affected by (public) service provision e.g. education, healthcare as well as household resources (Lau and Bradshaw, 2010). Direct poverty measures —such as deprivation—aim at overcoming the limitations of income and expenditure measures by focusing on outcomes (Ringen,

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¹ Since its development in the UK in the 1980s, the consensual approach (Mack and Lansley, 1985) has been used to the analysis of poverty and deprivation worldwide (e.g. Halleröd, 1994; Noble et al., 2004; Abe and Pantazis, 2013; Nandy and Pomati, 2015; Depio et al., 2018; Fifita et al., 2018) including Tonga and Tuvalu in the South Pacific.

1988; Nolan and Whelan, 2011; Qi and Wu, 2018), and are often viewed as a more accurate measure of living standards (Lau and Bradshaw, 2010; Guio et al. 2017).

Social and material deprivation measures capture individuals and/or household's capacity to afford a set of essential items (Townsend, 1979). Those who cannot afford a set of items are categorised as deprived. More importantly for the purpose of this paper, when individual level information is collected, this approach allows researchers to explore 'within household' variations in living standards (Nandy and Gordon, 2012; Main and Bradshaw, 2016; Qi and Wu, 2019). Main and Bradshaw (2012) find that child material deprivation is a better predictor of child well-being than parental income which is partially explained by the presence of deprived children in households that are not income poor as well as non-deprived children in income poor households.

2.2 Intra-household inequalities

Access to household resources is shaped by gender and age (Klasen and Lahoti, 2016; Main and Bradshaw, 2016; Brown et al., 2018a, b; de Vreyer and Lambert 2018). Household sharing has chiefly been studied in relation to gender inequality, with studies generally concluding that have less access to household resources compared with men although the size of the gap varies (World Bank, 2012; Klasen and Lahoti, 2016; Brown et al., 2018a, b). Furthermore, in a systematic review of intrahousehold food allocation in South Asia, Harris-Fry et al., (2017) note that food allocation is context specific, varying both by region and seasonally. Gender is also relevant for children access to resources, although studies comparing investment in sons and daughters have found that the direction of the gender bias is not universal (see Rodriguez, 2016).

The evidence on the allocation of resources between children and adults is comparatively limited (Main and Bradshaw, 2016), and findings inconclusive. There is evidence that households prioritise the needs of children low, high- and middle-income contexts (Baird et al., 2013, Klasen and Lahoti, 2016; Main and Bradshaw, 2016; Torre and Cangiano, 2018). Mood and Jonsson (2016) find that the material conditions of children remain stable or even improve when households experience in periods of economic duress. Using a multidimensional poverty measure Klasen and Lahoti (2016) find that households in India tend to protect both men and children, compared with women and older adults. Equally, household prioritisation of children's education and nutrition needs has been widely documented, with quantitative and qualitative evidence indicating that parents tend to protect children from the effect of poverty by going without themselves (e.g. Ridge, 2002; Oldewage-Theron et al., 2006; Nord and Parker, 2010; Hamilton and Catterall, 2010; Main and Bradshaw, 2012; Baird et al., 2013; Wong et al., 2015; de Zwarte, 2016). In the South Pacific, improving the well-being and opportunities of children is a key driver of household decisions, for instance improving education opportunities for children identified as the primary driver in the migration process (Torre and Cangiano, 2018). In contrast, in a study using nutrition data for sub-Saharan Africa Brown et al. (2018b), find that most undernourished children and women are found in non-poor households, and where the male head is not underweight. Similarly, in Bangladesh Brown et al. (2018a), find that children, the elderly and women are more likely to experience the consequences of poverty (e.g. to experience malnourishment) compared with men, even when the household does not live in income poverty. In their analysis of household expenditure in Burundi (Mercier and Verwimp, 2017) conclude that household poverty measures particularly under-estimate poverty among children.

The contrasting findings indicate that the intra-household distribution of resources is context specific, shaped both by household characteristics and the wider context (Wong et al., 2015; Rodriguez, 2016; Harris-Fry et al., 2017). The literature offers both economic and social/cultural explanations for intra-household inequalities. Household expenditure patterns change with income: in low- and middle-income countries the poorest households spend up to 80% of their incomes in food, clothing and fuel (Guesalaga and Marshall, 2008). As income increases, households spend relatively less on food and

energy and more on housing, education, and health², as children tend to be beneficiaries of the latter, an increase in household income would result in an increase in expenditure in children. Research on adults has found that, intra-household inequality in access to food is starker in households experiencing severe or unexpected food insecurity (Harris-Fry et al., 2017). The prioritisation of (adult) breadwinners, may be a rational response in households experiencing extreme poverty (although there is evidence of households prioritising children's needs even in the most extreme situations, e.g. a food crisis, de Zwarte, 2016). If that is the case, we would expect the relative position of children within the household to improve as extreme poverty decreases, and at the aggregate level for countries with low extreme poverty rates, to prioritise children more than countries with high extreme income poverty rates. Explanation 1: Households are less likely to prioritise children in contexts of low resources e.g. where a household experiences extreme poverty.

Household inequalities have been associated with social norms and accepted cultural practices regarding rights and obligations of household members, which in turn shape the relative power of household members. The feminist literature has highlighted how power imbalances and bargaining power shape the allocation of resources (Agarwal, 1997; Bennet, 2013). Changes in the relative position between spouses e.g. an increase in the relative income of one spouse, alter the pattern of household expenditures (Baland and Ziparo, 2017). The balance of power between men and women indirectly affects children. There is some evidence that female headed households prioritise children to a larger extent than men (Chant, 2007). Increased control over household finances by women is associated with greater a proportion of expenditure spent on children, and better nutrition and health outcomes for children (Richards et al., 2013). Explanation 2: Households are more likely to prioritise children in contexts where women have more control over household resources. Since we lack information on intra-household decision-making processes, here we compare female and male headed households.

The notion of relative power of household members shaping access to resources, can be extended to children to hypothesize that: Explanation 3: Households are more likely to prioritise children in contexts where children are highly valued. Thus, children access to resources is shaped by social norms both directly, because of their own position in the household hierarchy and indirectly, through mothers' influence in decision-making. All three explanations are plausible in view of the existing literature. This article will explore which explanations are consistent with the observed intra-household inequalities in Tonga.

3 Poverty and inequality in small island states: the Tongan context

Tonga is small island state in the South Pacific, formed by more than 150 islands and atolls. It is classified as a middle-income country. Tonga shares some of the challenges of other small island states were development is constrained by small size, remoteness, limited natural resources and a narrow production base. Remittances are the single most important source of national income, and families with no emigrated members will invariably receive remittances (Brown et al., 2014). Indeed, Tonga can be classified as a MIRAB economy (Migration (MI) Remittances (R), foreign Aid (A) and public Bureaucracy (B) with national income dominated by migrant remittances and overseas aid (Betram 2006). The local population works mainly in the agricultural sector as well as fishing: labour market participation is at 50%, 30% of which are subsistence workers (Tonga Department of Statistics, 2019a). Consumer goods are often imported and difficult to access for those not in the cash economy (Brown et al., 2014). Access to services (such as medicine or electricity) in the outer islands is challenging due to long distances and disperse populations. Over time, there has been progressive migration towards Tongatapu, the main island, which currently hosts approximately 75% of the population (Fifita et al., 2018).

² Access to other resources, such as welfare provision (including services in kind such as education and health), and more widely resource availability (e.g. in the private market) shape household's experiences of poverty and

and more widely resource availability (e.g. in the private market) shape household's experiences of poverty and deprivation (Paulus et al., 2010; Guio et al., 2017) and are likely to affect the intra-household allocation of resources.

Extreme poverty rates are low. The latest World Bank estimates identify 3% of the population in Tonga as living on less than a dollar a day (ADB, 2018). The absence of absolute poverty has been associated with a traditional culture of sharing and mutual obligation that extend beyond the family to the clan and neighbourhood (Abbott and Pollard, 2004). According to a recent report by the Tonga Department of Statistics, one in three children and one in four adults experience multidimensional poverty, defined as experiencing both low income and being deprived of at least three socially perceived necessities (SPNs), i.e. items that a majority of the population considers no-one should go without (Fifita et al., 2018). The higher poverty rates among children reflect higher risk of poverty among households with children.

Women have traditionally been recognised as having high status in Tongan society (James, 1986; Filihia, 2001). Sisters, particularly the eldest, play a key role in family events. However, Lee (2017) has argued that this high status does not necessarily translate into power. Only 7.7% of parliament sits are held by women (UNDP, 2019). Tonga is also one of only six countries that have signed the Convention for the Elimination of all forms of Discrimination Against Women. After reviewing the position of Tongan women across domains Lee (2017) concludes that the high status of women is ceremonial, but men hold most of the power in both the private and public spheres. All in all, women tend to manage the household and have a strong voice in in running the family, although men have the final decision. Only 22% of households are headed by women (Tonga Department of Statistics, 2014).

Polynesian societies place high value on protecting children, and they are often prioritised in decision making (Fifita, 2016; Torre and Cangiano, 2018). In traditional Tongan culture, children are defined as 'the most important things in this world' (Morton -now Lee-, 1996, p. 44), among children, the eldest daughter is granted the highest status and may have more resources available to her compared to other children e.g. her own room. Networks of mutual obligation are strong and it is customary for communities beyond extended family networks (e.g. the village or neighbourhood) to cover the needs of children in impoverished households, particularly with regards to education (Fifita, 2016; Lee, 2017). Altogether low extreme poverty rates, the role of women in the household and the cultural value of children suggest that households in Tonga will prioritise children over adults, covering their needs where possible, even at the expense of adult needs.

4 Data and Methods

This paper uses data from a consensual deprivation module included in the Tongan Household Income and Expenditure Survey (2015/16), a nationally representative survey to study patterns of child and adult deprivation in households with children. The HIES has a 98.8% response rate and was designed to allow disaggregation of results for the capital, rural areas and the outer islands (Tonga Department of Statistics, 2017). Further details on the items and wording used can be consulted in Appendix 1. Except when otherwise stated, the paper the paper uses data on households with at least one child aged 15 or under (n=1.362), around 75% of households in the sample. Estimates and confidence intervals are produced using complex samples.

The consensual approach builds on Townsend's (1979) theory of Relative Deprivation. Townsend defined poverty as inadequate command over resources. The consequence of poverty is material deprivation: the inability to cover social and material needs. The cornerstone of the consensual approach is the identification of socially perceived necessities through a democratic process/consensus building process (Mack and Lansley, 1985). The consensual approach operationalises Townsend's concept of material deprivation and allows the development of both child and adult specific deprivation measures that reflect their specific needs (Main and Bradshaw, 2016).

Indices of social and material deprivation for children and adults are produced using the consensual approach and refined using the Bristol Method (Gordon, 2006; Guio et al., 2017). The development of the context specific, valid and reliable material development indices is described in detail by Fifita and colleagues (2018). To ensure that the measures reflect the local context, only items that the majority

of the population regards as necessities are included in the index. Indices that are not valid or reliable will result in a misidentification of the poor and provide unstable poverty estimates (Najera, 2018). Thus, individual indicators where tested for validity by assessing their correlation with subjective financial strain and low income. The reliability of the index as well as individual components was assessed using Classical Reliability Theory. The final adult index has 9 items and a Cronbach alpha of 0.874, considered as highly reliable. The child index has 10 items and a Cronbach alpha of 0.872, also highly reliable. The list of items in each index can be consulted in Appendix 1.

Individuals aged 16 or over responded to the adult questionnaire. Information on child deprivation is collected through adult report (usually parents). Adult respondents are asked to answer thinking about all the children in the household. If any child lacks the item all children are considered as deprived. This means that the data does not allow direct comparison between children with different characteristics (e.g. by gender or age). This approach may lead to overestimating child deprivation where some but not all children in the household are deprived. This approach is widely used (e.g. Main and Bradshaw, 2016; Guio et al., 2017)³, and suitable for the comparison of children and adults, the aim of this paper.

The deprivation score is the sum of the items that individuals (or children in the household) lack because they cannot afford them (i.e. enforced lacks, Mack and Lansley, 1985).⁴ Where items are not applicable to a specific age group (e.g. tutorial lessons for those not in school) individuals are categorised as not deprived, since one cannot be deprived of things one does not need. Table 1 shows the proportion of children (column one), adults in households with children⁵ (column two) and who are deprived of at least one item, at least two items and so on. A substantial minority -36% of adults and 39% of children- are deprived of at least one item. Adults living in households with children have higher deprivation rates across thresholds. As expected, deprivation rates decrease progressively as a more severe threshold is applied. Around 28% of children and 27% of adults are deprived of two or more SPN, 22% of children and 21% of adults lack 3 or more items and one in thirteen children and adults (around 7%) are deprived of 6 or more essential necessities.

Table 1 Deprivation rate adults and children by severity (households with children) [95% CI]

	C	hildren	Adults			
1+	39	[35-45]	37	[32-42]		
2+	28	[24-32]	29	[25-33]		
3+	22	[19-26]	21	[17-25]		
4+	16	[13-19]	17	[14-20]		
5+	11	[9-13]	12	[10-15]		
6+	7	[6-9]	8	[6-11]		

Source: Author's HIES 2015/16

In order to explore the intra-household inequalities Main and Bradshaw (2016) classify households in four categories according to the interaction between child and adult poverty (see Figure 1). Households where neither children nor adults are poor are labelled congruous non-poor, and the congruous poor are those where both children and adults are poor. Households where children are not

³ Children's perceptions and preferences may differ from those of adults (Mood and Johnson, 2016; Abe, 2018), however the data do not allow the exploration of these differences.

⁴ For each item they lack, respondents are asked whether they lack the item because they cannot afford it, they do not want it or for another reason. Only individuals and households who lack an item because they cannot afford it are categorised as deprived for that item.

 $^{^{5}}$ Adults living in households with children have very similar deprivation rates to all adults.

poor, but adults are poor are labelled incongruous protected. While the opposite, where children are poor, but adults are not-poor are labelled incongruous exposed. When using this instrument, individuals classified as non-deprived may (except when a1+ item threshold is used) still be deprived of some items. For example, when a three items threshold is used, a household where children experience two enforced lacks and adults experience three enforced lacks would be categorised as Incongruous Protected. These children are still experiencing some deprivation, albeit less severe than that experienced by the adults in the household.

Figure 1. Child adult poverty within households

		Children	
		Poor	Not poor
Adults	Poor	Congruous poor	Incongruous protected
	Not poor	Incongruous exposed	Congruous non-poor

Source: Adapted from Main and Bradshaw (2016).

For consistency, here we maintain the original terms used by Main and Bradshaw (2016), although we use the term deprived (instead of poor) to reflect the measures used. Main and Bradshaw (2016) justify the use of the labels "protected" and "exposed" on the basis of qualitative evidence in the UK that households protect children by going without (e.g. Ridge, 2002). This is also consistent with our expectations for Tonga (see Section 3). However, Main and Bradshaw (2016) acknowledge that other factors may shape intra-household inequalities between children and adults. Deprivation rates reflect access to resources, both within and beyond the household e.g. by the state. In Tonga, the role of extended networks in covering children's essential needs (Lee, 2017) mean that children may have access to non-household resources that are not available to adults. Given that the needs of children and adults differ - and thus so do the items in the indices - intra-household inequalities between children and adults may also be explained by the relative availability of items. While all items in the deprivation indices reflect socially perceived necessities, some items are more accessible than others and thus some forms of deprivation are more common than others (Fifita et al., 2018). For instance, households are less likely to lack food, that can be grown in the land, compared with imported items. To explore this possibility, we complement the analysis of intra-household inequality using Main and Bradshaw's typology, with an examination of children deprivation patterns (the combination of individual deprivations). We return to these issues in the discussion.

5 Findings

5.1 Intra-household deprivation in Tonga

Table 2 shows the distribution of households in the matrix for different deprivation thresholds (1+ up to 5+ items). Congruous results are observed in the vast majority of households regardless of the threshold used. As expected, higher thresholds, reflecting more extreme forms of deprivation, result in lower deprivation rates and higher consistency between children and adults (bottom row). However, even when the lowest threshold (1+) is used, 80% of households are in the congruous categories.

The relative size of the incongruous categories offers additional insight on intra-household inequalities. If the majority of households with low resources prioritise children over adults, we would expect the incongruous protected category to be substantially larger than the incongruous exposed. If by contrast households prioritise adults, then the exposed category would be larger. In Tonga, across thresholds, in roughly half of the incongruous households, children are protected, while in the other half children are exposed. The results do not match with either a 'children first' or a 'children last' hypothesis.

Table 2. Child and adult deprivation within households [95% CI]

	1+		2+		3+		4+		5+	
Congruous deprived	28	[24-33]	19	[15-22]	13	[11-16]	9	[7-12]	5	[4-6]
Incongruous protected	10	[7-13]	11	[8-14]	8	[6-10]	7	[5-9]	7	[5-9]
Incongruous exposed	10	[8-13]	7	[6-9]	7	[6-10]	6	[4-7]	5	[4-7]
Congruous non-dep	52	[47-57]	63	[59 - 68]	72	[68-76]	78	[75 - 81]	83	[80-86]
Total congruous	80		82		85		87		88	

Source: Authors' HIES 2015/16

The HIES allows the calculation of individual deprivation scores for adults, providing a more nuanced picture of intra-household inequalities. These scores allow us to distinguish between households where all adults are deprived/not deprived, and those where some, but not all experience deprivation. Henceforth, a three items threshold is used in the analyses, thus children and adults who are deprived of three or more items are categorised as deprived. The threshold reflects the one used by the Tongan Department of Statistics in their latest SDG report (Fifita et al., 2018), as well as practical considerations in terms of sample size. Given that the chosen threshold can alter the findings, the analyses were run using three thresholds (2,3, and 5 items). Findings are robust to the use of different thresholds.

Table 3 reports the proportion of households where all, some or no adults are deprived according to the children's deprivation status. The results presented correspond to a three items deprivation threshold, but the findings are robust to the use of more or less severe thresholds. As in the previous section when comparing children and adults, the picture that emerges is one of consistency. In most cases when one adult is deprived all adults in the household are deprived (85% of those who experience deprivation, total column). In 79% of households where children are deprived, all adults are deprived. In 25% of households where children are not deprived adults experience deprivation, and in the majority of those (80%) all adults are deprived. The data is not consistent with a scenario where some adults (e.g. mothers) sacrifice their needs for children. Instead, all adults tend to go without reaffirming the message of consistency.

Table 3. Deprivation among adults in the household depending on whether children are deprived (3+ items) [95% CI]

			Chile	dren		
Adults	Depi	rived	Not	deprived	Tota	ıl
All adults deprived	79	[72-85]	20	[17-24]	33	[29-37]
Some adults deprived	8	[5-15]	5	[3-7]	6	[4-8]
No adults deprived	13	[9-18]	75	[71-79]	61	[57-65]
Total	100		100		100	

Source: Authors' HIES 2015/16

5.2 The characteristics of unequal households

Since household inequalities are affected by the overall resources available to the household, it is possible that what distinguishes congruous and incongruous households is their command over resources. Households where both adults and children are deprived may simply be poorer (have less resources) than those where only some or no members are deprived. Descriptive results indicate that effectively, the congruous deprived have the lowest average household income of all categories and are the most likely to report difficulties to keep up with bills (81% report struggling to pay bills). At the other end, the congruous not deprived households have the highest average income. Only 18% of

households in this category struggle to pay the bills. The exposed and protected households are somewhere in the middle and have similar average incomes. Most households in these categories report experiencing difficulties to pay bills. Exposed households are somewhat more likely to report difficulties to pay bills compared with the protected households (64% vs. 57%), but the difference is not significant. The congruous deprived are a poorer sub-section of the those experiencing deprivation.

To further explore factors that shape intra-household inequalities, we run a multinomial logistic regression. A key advantage of regression models is that these enable to control for confounding effects between independent variables. Since the aim is to understand the predictors of household prioritisation, the subsample of deprived households is analysed (n=448 households). Incongruous protected households are the reference category. Positive (negative) values indicate increased (decreased) probability of being in the exposed or congruous deprived category instead of the protected category. Statistically significant effects are identified in with stars. Income quintiles and educational attainment of the household head are used to control for the association between resources and deprivation outcomes. The aim is to identify factors other than income, associated with increased probability of a household being in the congruous deprived or exposed category, in contrast to a 'protected'.

Table 4 Multinomial logistic regression DV Intra-household deprivation (ref. I Protected) [CI 95%]

	Congruous	Exposed
Ref (Urban)		
Tongatapu Rural	-0.81	-0.71
	[-2.05,0.43]	[-2.06,0.63]
Outer Islands	-0.66	-1.63**
	[-1.42,0.10]	[-2.64,-0.62]
Number of adults	- 0.41***	- 0.64***
	[-0.62,-0.20]	[-0.92,-0.36]
Number of children	0.26**	0.39**
	[0.07, 0.45]	[0.14,0.64]
Female household head (ref male)	-0.12	-O.7
	[-0.88,0.65]	[-1.56,0.16]
Head work status (ref: Paid work)		
Self-consumption	-0.27	0.18
	[-1.08,0.54]	[-0.68,1.04]
Unpaid work	-0.12	- 1.19**
	[-0.95,0.70]	[-2.32,-0.06]
Inactive	-0.05	0.45
	[-1.04,0.94]	[-0.68,1.58]
Constant	-1.49	1.06
N	448	

Source: Author's HIES 2015/16. Legend: *p<0.05, *** p<0.01, **** p<0.001. Income quintile and education of the household head included as controls.

There is an association between household composition and intra-household inequality. The probability of households being in the protected category increases with the number of adults.

Increasing number of children is associated with higher risk of being in both the congruous and exposed category. The latter is likely to reflect both increased needs as the number of children increases and increased probability that at least one chid will be deprived of one item. Households in the outer islands are more likely to be in the protected category compared with those in the capital (the effect is only significant for the exposed category). Interestingly, no significant effects are observed for female headed households. Households where the head does unpaid work as their main occupation as less likely to be in the exposed category (more likely to be protected). Additional tests, not shown, suggest that this is not a gender effect. No significant effects are observed for other work status, including self-consumption.

After adjusting by household income and education of the household head, household size and location (living in the outer islands as opposed to the capital) are the two key predictors of household inequality. Other factors identified in the literature such as living in a female headed household (Chan, 2007) do not show significant effects.

5.3 Patterns of child deprivation

What forms of deprivation are more common among children in Tonga? Do these vary according to intra-household deprivation e.g. between children in exposed and congruous deprived households? To answer those questions in this final sub-section we examine item deprivation. Table 5 reports child deprivation rates for all children items collected in the survey. The first column (all) shows the percentage of children who lack each specific item. Leisure equipment, tutorial lessons and adequate books, have the highest deprivation rates: one in five children lacks each of these items, and one in three children are deprived from at least one of these. Additionally, one in ten children do not have a space where they can do their homework at home. A similar proportion cannot afford school trips and events that cost money. Food deprivation is, in comparison, relatively low but still an issue for a large minority: 18% of children are deprived of at least one food item. Almost one in ten children (8%) cannot afford three meals a day, 13% cannot afford fruit and vegetables daily, and 5% cannot afford to eat meat or fish daily. School equipment and shoes have the lowest deprivation scores (2-5%). Finally, 13% of children cannot afford celebrations on special occasions. Overall, the highest deprivation rates correspond to extended educational activities and the lowest to essential school equipment and shoes.

Children living in households where adults are also deprived (congruous category, column 3) have higher deprivation rates across almost all areas compared with children in the exposed category (column 2). This is consistent with lower average income and higher financial strain in congruous households. Patterns of deprivation are similar for both. Leisure equipment, tutorial lessons and books have the highest deprivation rates. The exceptions are school trips that cost money, beds and bedding, and school uniform, which have similar deprivation rates for children in exposed and congruous households. Children in exposed households are somewhat more likely to lack a dedicated area to study and books suitable for their age (although the difference is not statistically significant).

To ease comparison, column 4 shows the ratio between the congruous and the exposed columns. A value of one indicates items where children the congruous and exposed categories have equal deprivation rates, values below one indicate that deprivation is higher for children in exposed households, while values above one designate the opposite.

Children in exposed and congruous deprived households experience different patterns of deprivation. The largest gap between children in congruous and exposed households corresponds to food items, followed by celebrations, these are deprivations which are likely to be indicative of severe poverty in Tongan society. Children in congruous poor households are more than twice as likely to lack three meals a day, and almost twice as likely to lack a proper meal with protein. Differences are smaller but also large for daily fruit and vegetable: and 35% of the exposed category are deprived compared with

 $^{^6}$ All child items in the survey are included regardless of whether they are in the MDI as all were identified by the pubic as items no-one should do without.

the congruous deprived category. Large differences in item level deprivation rates are also observed for celebrations on special occasions, clothes and shoes. Children in congruous deprived households are almost twice as likely to miss out on celebrations compared with the exposed category (62% vs 32%). A small proportion of children living in households where adults are not deprived experience food deprivation. Small sample sizes prevent a detailed analysis of this sub-group. Descriptive results indicate that in the vast majority of cases (>80%) where children experience food deprivation, so do adults in the household. This would suggest that rather than households prioritising adults over children, the whole household may be missing on essential items, despite adults not reaching the deprivation threshold. This may reflect actual access to resources, or adults reporting not wanting items that they cannot afford, and thus counting as 'not deprived'.

Table 5 Deprivation rate for all, exposed and congruous deprived children [95% CI]

	All		Exp	osed	(Congruous	Ratio C/E
Leisure equipment	22	[14-26]	78	[57-91]	81	[74-87]	1.0
Tutorial lessons	21	[17-26]	78	[56-90]	69	[60-76]	0.9
Books	20	[18-24]	85	[74-91]	80	[73-86]	0.9
Fruit and vegetables	13	[10-16]	36	[26-48]	57	[46-68]	1.6
Celebrations	12	[10-15]	33	[21-47]	63	[53-72]	1.9
New clothes	10	[8-13]	30	[18-44]	47	[37-58]	1.6
School trips	9	[7-12]	37	[25-49]	37	[28-48]	1.0
Three meals	8	[6-10]	20	[11-33]	44	[34-55]	2.2
Homework space	8	[7-10]	40	[30-52]	35	[28-44]	0.9
Beds and bedding	8	[6-10]	32	[23-44]	35	[27-45]	1.1
Meat or fish daily	4	[3-7]	12	[5-25]	20	[14-28]	1.7
Shoes	3	[2-4]	11	[4-27]	13	[9-18]	1.2
School equipment	3	[2-5]	15	[8-27]	13	[9-19]	0.9

Source: Author's using HIES 2015/16. Ratios >1.5 in bold. Figures for "all" correspond to children in households where there is also adult information and thus differ slightly from the one's published in Fifita et al., (2018).

The findings presented in this section are consistent with the interpretation that households in the South Pacific prioritise the needs of children that are viewed as prioritary and/or affordable. Children in congruous deprived household experience more severe forms of deprivation, such as food and clothing, compared with those in exposed households. In contrast, children in the exposed category are more likely to lack items corresponding to additional activities related to schooling. A key finding is that by combining data on children and adult deprivation it is possible to identify a sub-set of highly vulnerable households.

6 Discussion

Patterns of resource allocation between children and adults are shaped both by household characteristics and the wider context. In the literature review we identified three explanations for intra-household inequalities: (1) Households are less likely to prioritise children in the context of limited resources, (2) Households are more likely to prioritise children when women have more control over resources (operationalised as female headed households), and (3) Households are more likely to prioritise children in contexts where children are highly valued. In Tonga, low extreme poverty rates and the high value placed on children suggested that households would protect children, where necessary, by adults going without to cover children needs. At the household level, we hypothesized that female headed households would be more likely to prioritise children than male headed households. The analysis of the HIES deprivation data does not fully support these expectations.

In terms of household characteristics, households are more likely to protect children when there are fewer children or more adults. Location also matters. Households in the outer islands are more likely to protect children. This may reflect actual differences between the two areas with regards to within household resource allocation. The findings may also result from adaptive preferences and/or different perceptions of sufficiency and need in the more remote islands. Female headed households are no more likely to protect children than male headed households.

A key finding is that there is a substantial overlap between child and adult deprivation outcomes within households. Where children are deprived, adults tend to be deprived too. The finding is robust to the use of different thresholds. This has implications for the identification of the poor: in most cases, identifying deprived adults or households will identify deprived children. However, in between 12 and 20% of the cases (depending on the threshold used) children would be mis-classified. Policies that aim to reduce child poverty may miss vulnerable individuals if the targeting in based on adults or household characteristics. Thus, policies that target poor households may not effectively target poor children, a finding that echoes previous literature on intra-household inequalities (Brown et al., 2018b).

The congruous deprived are a poorer subset of those experiencing deprivation: they have on average lower incomes and a higher probability to experience difficulties to make ends meet. Furthermore, in households where both adults and children are deprived, children tend to experience more severe forms of deprivation (lacking essential necessities such as food and clothing) compared with households where only the children are deprived. Thus, in identifying the poor there is value in examining both child and adult deprivation as these provide complementary data about households' resources (Main and Bradshaw, 2012). By collecting data on children and adults, it is possible to identify a more vulnerable subset of households.

The small size of the incongruous categories (13% when using the 3+ items threshold) indicates that where possible Tongan households allocate resources to all members. Incongruous allocations, where some members are deprived while others are not, are more common in contexts of scarce resources. Main and Bradshaw (2016) find that, in those situations, households tend to prioritise children's needs. In their data households where children are protected are far more common than households where children are exposed. This pattern is not apparent in the Tongan data. In half of the incongruous households, children are protected (adults are deprived but children are not), while in the other half the opposite trend is observed. Does this mean that households in Tonga are less likely to prioritise their children compared with other countries? While this is a possible interpretation, it is at odds with the high value placed on children by Tongan society (Lee, 2017). The analysis of individual deprivations (section 5.3) provides an alternative explanation.

The observed deprivation patterns suggest that the exposed or protected position of household members partially reflects the resources available to households. Access to resources such as farming land, family and community support or the availability of services shape experiences of deprivation. Deprived children living in households where adults are not deprived tend to lack extended educational opportunities such as leisure equipment, but not essential school equipment, or basic needs such as food or clothing. This indicates, that households prioritise the basic needs of children (food, education and clothing). While all items in the index have been ranked as necessities of life (i.e. items that no-one should do without), households may perceive some as more relevant than others, and prioritise accordingly in contexts where resources are insufficient to cover all needs. Specifically, households in the exposed category may prioritise essential items, such as food for all household members, over items that are viewed as non-essential such as leisure activities.

Child and adult deprivation outcomes may also partially reflect the relative cost and availability of items in Tonga. Households may lack items that are expensive or otherwise difficult to obtain locally. While Tonga is a middle-income poverty and extreme poverty rates are low access to consumer goods, such as books, which are often imported is relatively expensive. Additionally, access can be limited in

rural areas and particularly in distant small islands (Fifita et al., 2018). Thus, household deprivation patterns will partially reflect the availability of items in the local context so that household members are more likely to lack items that are often imported and/or costly, such as books and sport equipment (Tonga Department of Statistics, 2019b). This suggests that rather than ranking the priorities of household members, households make complex decision-making processes where they weight the relative value but also availability and cost of different options. Further research using qualitative approaches would also gain to gain a better understanding of decision-making and prioritisation processes within households.

The study is limited by the data available. The HIES collected individual deprivation for adults but not children. There may be differences between children that have not been explored. For example, older daughters, who hold a special position in the household (Lee, 2017), may be less exposed to deprivation, while children cared for by relatives may have less access to household resources. Having individual children information would allow for a more detailed analysis of intra-household inequalities among children. Additionally, collecting data from children themselves, would allow for measures to reflect their experiences, and preferences.

Our research adds to the evidence that patterns of intra-household inequality are context specific. Future research should explore whether this trend is repeated in other South Pacific countries as well as in other middle-income countries. In using material deprivation indicators to identify intra-household inequalities, there is value in observing not only who is deprived, but also the patterns of deprivation as they offer insight on decision making within households.

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Appendix 1: Adult and child items, HIES 2015/2016

DeprivationIndexADULT ITEMSYTwo pairs of properly fitting shoes, including a pair of all-weather shoesTwo pairs of shoesYTwo meals a dayTwo meals a dayYA small amount of money to spend each week on yourselfMoney for selfNClothes for special occasionsClothes for special occasionsYReplace worn-out clothesReplace worn-out clothesYGet together for a meal or drink monthlyGet together monthlyYPresents for friends or family once a yearPresents once a yearYEnough money to be able to visit friends and family in		Full description	Short description
Two pairs of properly fitting shoes, including a pair of all-weather shoes Two pairs of shoes Two meals a day Two meals a day A small amount of money to spend each week on yourself N Clothes for special occasions Y Replace worn-out clothes Y Get together for a meal or drink monthly Y Presents for friends or family once a year Two pairs of shoes Two pairs of shoes Two meals a day Clothes for self Clothes for special occasions Replace worn-out clothes Presents once a year	Deprivation		
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Y Two meals a day Y A small amount of money to spend each week on yourself N Clothes for special occasions Y Replace worn-out clothes Y Get together for a meal or drink monthly Y Presents for friends or family once a year Two meals a day Two meals a day Two meals a day Clothes for special occasions Replace worn-out clothes Get together monthly Y Presents once a year	Y	Two pairs of properly fitting shoes, including a pair of	
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Y Get together for a meal or drink monthly Y Presents for friends or family once a year Presents once a year			
Y Presents for friends or family once a year Presents once a year		_	_
To a control of the c		Get together for a meal or drink monthly	Get together monthly
Y Enough money to be able to visit friends and family in		Presents for friends or family once a year	Presents once a year
Enough money to be able to visit mends and faining in	Y	Enough money to be able to visit friends and family in	
hospital or other institutions Money for hospital visits		hospital or other institutions	Money for hospital visits
Y Access to safe public transport such as buses and boats Access to transport	Y	Access to safe public transport such as buses and boats	Access to transport
N A good meal with meat/fish on Sundays and other	N	A good meal with meat/fish on Sundays and other	
special occasions Meat or fish once a week		special occasions	Meat or fish once a week
Y Fresh fruits and vegetables at least once a day Fruit and vegetables	Y	Fresh fruits and vegetables at least once a day	Fruit and vegetables
CHILD ITEMS (0-15)		CHILD ITEMS (0-15)	
Y Properly fitting shoes Shoes	Y	Properly fitting shoes	Shoes
Y Some new, not second-hand clothes. New clothes	Y	Some new, not second-hand clothes.	New clothes
Y Three meals a day Three meals	Y	Three meals a day	Three meals
Y Fresh fruits and vegetables at least once a day Fruit and vegetables	Y	Fresh fruits and vegetables at least once a day	Fruit and vegetables
N One meal with meat, chicken, fish or vegetarian	N	One meal with meat, chicken, fish or vegetarian	
equivalent daily. Meat or fish daily		•	Meat or fish daily
Y Celebrations on special occasions such as birthdays,	Y	Celebrations on special occasions such as birthdays,	
Christmas or religious festival Celebrations			Celebrations
N All school uniform of correct size and equipment	N		
required (e.g. Books, pen) School equipment		required (e.g. Books, pen)	School equipment
N To participate in school trips and school events that	N	To participate in school trips and school events that	
cost money. School trips			School trips
Y A suitable place to study or do homework. Homework space		÷ •	Homework space
Y Tutorial lessons after school at least once a week	Y		
(during term time) Tutorial lessons		(8	Tutorial lessons
Y Enough beds and bedding for every child in the	Y		D 1 11 11
household. Beds and bedding	V		O .
Y Leisure equipment (e.g., sports equipment or a bicycle) Leisure equipment			Leisure equipment
Y Books at home suitable for their age (including reference books and supplementary exercises) Books	ĭ		Books