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Setting 'poverty thresholds': whose experience counts?

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Abstract

According to the UN Sustainable Development Goals (SDGs), poverty eradication in the 21st century means everyday access to decent health care, education and livelihoods, political participation, social inclusion, a clean and safe environment, and more. These are aspirational goals that together support a decent quality of life. Crossing monetary, 'poverty thresholds' may enable such goals. Most estimates of 'where' the monetary threshold lies derive the estimates circularly from monetary costs of living. The link to quality of living is thereby made by fiat, untested empirically in everyday human experience. We already know we can measure income independently of middle class quality of life, and probe for relationships between the two. Why not for poverty too? A quantity of money where quality of life changed would mark a genuine threshold required for example to escape from poverty traps. Using this approach, studies in quality of work–life, using multiple indicators, have identified at least three thresholds where quality of life ticked markedly upwards, including inter-threshold *ranges* where gradients went from zero to positive. The concept of work–life balance suggests that this approach may be usefully extended to include quality health care, education, and other SDGs in sustainability science.

Keywords SDG1 · Eradicating poverty · Measuring poverty · Evaluation

A problem statement

Policy makers around the world rely on poverty thresholds to make, evaluate and improve their anti-poverty initiatives. These thresholds are important because they yield higher or lower estimates of poverty levels, levels of intervention and their evaluation (Bullock 2019). The thresholds themselves are normally calculated from periodically updated costs-of-living surveys, and associated indexes. They are circularly econometric. Drawing various poverty thresholds at $1.90 or $3.20 a day, monthly wage, or 60% of median national income, and so on, then takes a complete leap of faith into people's actual, everyday quality of life:

> "Poverty lines… do not explicitly claim to be SSPLs (Social Subjective Poverty Lines). More commonly they are based on an estimated cost of a set of basic

consumption needs, typically anchored to nutritional requirements for good health… it would seem unlikely that any national poverty line would be accepted in practice if it differed significantly from the SSPL. In other words, … the SSPL *is* the more fundamental concept underlying the 'objective' poverty lines found in practice" (Ravallion et al. 2008, p. 5, parentheses added).

Questionably from a scientific and a sustainability point of view, major policy agencies across the United Nations still implicitly assume, rather than test, the assumption that pecuniary and material poverty thresholds actually reflect empirical thresholds that people subjectively cross from (1) poverty to (2) freedom from it. For example, what is arguably today still the major global measure of human development, the *Human Development Index*, lists gross national income per capita as an 'indicator' of poverty nationally and internationally (United Nations Development Programme 2020). Ironically even the wider-focused *Multidimensional Poverty Index* (United Nations Development Programme 2019) places material standards of living (e.g., access to electricity) as indicators 'of' poverty, rather than being means 'to' reduce it in everyday life (Ravallion et al. 2008). Hence, claims that policy is getting "beyond income"

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(United Nations Development Programme 2019) can be scientifically challenged. Income is not an outcome.

Despite not being an outcome, income is still a means to many ends (Sen 1999). In that sense money does matter significantly, and is practicable to count and measure. The problem though is that there are multiple ways for pecuniary costs of living to come majorly adrift of subjective poverty thresholds. First, material goods do not necessarily buy quality of life, just as being in material hardship does not guarantee being miserable (https://happyplanetindex.org/about). Second, poverty is relative as well as absolute (Iceland 2009). Inequality matters. The subjective poverty line in urban USA and what is widely considered rural poverty in say South America may well differ due to different normative reference groups as well as to different Gini coefficients, inside respective national and/or regional economies (Sen 1999, p. 111). Third, there may not even *be* a subjective threshold (Kraay and McKenzie 2014). Hence, the real scientific question for policy and the SDGs becomes not only, 'is there a subjective poverty threshold', but also, and if so, '*who gets to decide it?*'.

The ethos of the SDGs, and human development generally, suggests that people themselves are the only arbiters, and subject matter experts, who can—and should—finally decide (United Nations 2019). Asking people experiencing hardship directly for their monetary subjective poverty line is one option for taking the subjective measure of any poverty threshold, but this too could just as easily become unintentionally biased. For example, the question 'what is the point at which poverty ceases?' would assume that each individual being asked had already experienced a range of incomes from which to be in a position to accurately judge. Most people will likely not have had such experiences. According to Oppenheimer (2004), for instance, there may be distortions based on availability heuristics ("What I know") and discounting biases ("What I do not").

Alternatively, we might take our criteria for what counts as poverty directly from the UN SDGs themselves, at a subjective level, and in everyday life. First among these SDGs is the eradication of poverty, "in all its forms, everywhere" (United Nations 2019). 'In all its forms' implies that poverty refers to a range of restricted opportunities, across health, well-being, work and life, absolute and relative (SDG-10). 'Everywhere' implies across all countries, including so-called richer ones. Poverty actually means poverties of opportunity to obtain a decent quality of life, and daily overall satisfaction with it, rather than what products available money can buy. Hence, we still need to find a way to encompass subjective quality of life, in humanistic terms.

An influential example of a humanistic approach in development is the initiative from the government of Bhutan, which replaced GDP (for gross domestic product) as a principal yardstick of development with the more humanitarian GNH (for gross national happiness). Although GNH measures do include income, and straddle groups with varying levels of living standards, income itself is not treated as a key variable. For example, it is not positioned as a potential enabler/predictor of well-being in general, or of happiness in particular (Centre for Bhutan Studies and GNH Research 2016). Similarly, notable global projects, such as the World Values Scale (WVS), although they straddle lower to higher income countries, tend to focus more on values than on income, and/or on how values in the WVS predict macro-level GDP (World Values Survey 2020). Happiness has indeed been studied elsewhere as a function of income, but largely at higher levels of income, such as > $75 K US per annum (Jebb et al. 2018). Thus, linkages between income and happiness levels at the base of the income spectrum (where most of the world is positioned) are less well understood (Galinha et al. 2016).

Summing up, with respect to anti-poverty goals, we have a heavily econometric approach on one hand, and a heavily subjective approach on the other, with no real bridging, either conceptually or empirically, between the two, even though both have much to offer sustainability science. Bridging-wise, drawing a meaningful poverty line would involve finding where, on any given income (and/or asset) spectrum, subjective quality of life actually transformed, from 'in poverty' to feeling 'free from it.'

An approach and early results

Approach

The clearest and arguably most valid way of checking whether costs-of-living surveys and any costs-based poverty threshold really capture where quality-of-living transformed is to measure quantity of income on one hand and quality of life on the other—and to subsequently examine the relationship, if any, between them.

Figure 1 depicts a hypothetical relationship between Quantity of Income on the *x*-axis (which might also include assets), and subjective quality of life on the *y*-axis. The sigmoidal segment of the curve in Fig. 1 ends with diminishing marginal returns (at Cusp 3), before inflecting upwards again. The overall pattern is thereby neither linear nor logarithmic, but a complex pattern of 'flat–rise–pause–rise.'

The sigmoidal segment of the complex function in Fig. 1 derives from the theory of Poverty Traps (Kraay and McKenzie 2014). In development economics, a poverty trap exists whenever incomes are so low that their value today makes no difference to their value tomorrow—there is no income mobility, since everyday needs are often serviced by debt (Chetty et al. 2013). Beyond purely monetary definitions of poverty, i.e., toward socially subjective poverty,

Fig. 1 Quality of life as a function of quantity of income near income spectrum base
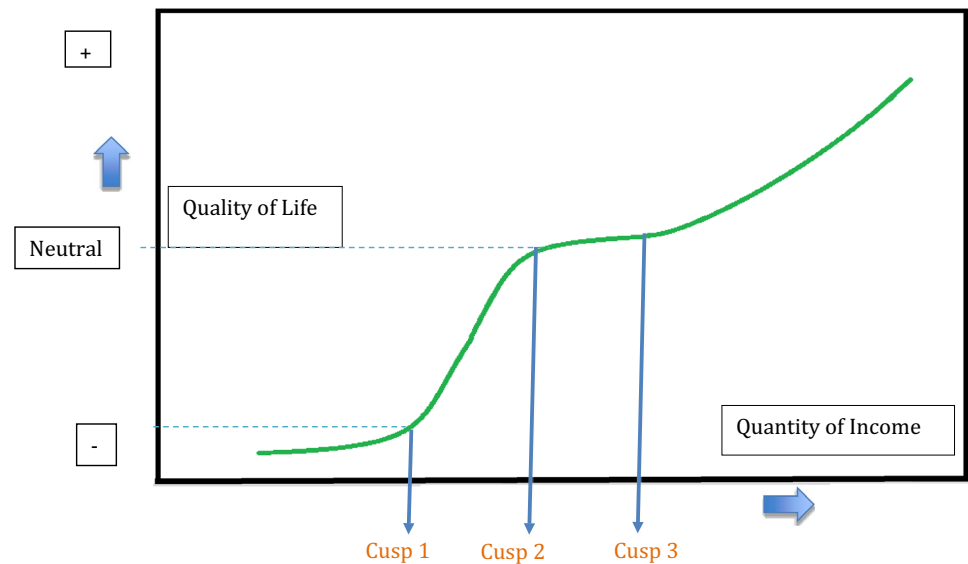
Note: Extending the green line rightward into higher incomes might bring further diminishing marginal returns (Jebb et al, 2018). Higher incomes are not our main focus in this article.

Poverty Traps include not only the purely econometric criterion of income tomorrow, but also well-being and quality of life (Banerjee and Duflo 2011; Barrett and Swallow 2006). In theory, income today would first lead to some enhancement in quality of life (Fig. 1). This may then in principle *mediate* between income today and upward income mobility in the future (for details, see Carr et al. 2016).

The important sustainability point in this theory, for achieving the SDGs, is that without a substantial change in material circumstances of income (beyond Cusp 1), by an exogenous "big push" (Easterly 2006), quality of life, at lower incomes, is predicted to stay flat, depressed (Fig. 1). The trap stays shut. However, the converse may also occur. Crossing the income point at which the curve starts to rise (Cusp 1, in Fig. 1), people would—in theory—start to escape from basic poverty traps, before tailing off with diminishing marginal returns from Cusp 2 (Carr et al. 2017).

Consistent with poverty thresholds, therefore, Poverty Trap theory predicts that there will be a meaningful, empirically valid point, beyond which quality of life will subjectively start to improve. However, quality of life may not climb above neutral (in Fig. 1, hypothetically) *until Cusp 2 has been reached*. Surprisingly therefore, this kind of hypothesis is consistent *not* with a simple poverty 'threshold' at all, but rather with a poverty interval, in other words a pivotal, potentially life-changing '*range*'.

Figure 1 may seem counter-intuitive in other ways, too. First, it shows that for individuals below a moderate poverty threshold, their own quality of life may be negative. Without

defining a negative quality of life, this might suggest to readers, somewhat arrogantly and presumptuously perhaps, 'a life not even worth living'. Above, we gave the example of attending inner-city schools as a child and teenager where a substantial majority of students lived below the poverty line, but without necessarily considering their quality of life to be negative at all. Similarly, a person who hitchhiked through South America with very little money, often befriending and staying with objectively poorer people than they knew in the USA, might never have thought they had endured a negative quality of life.

These points are crucial and cogent. In fact, they are the very reason for arguing that it is necessary not to be presumptuous, but in fact to actually measure people's own subjective quality of life directly, as well as quantity of income. This can be done for example in radically unequal and more equal societies, economies, regions, etc. If we did this, and arguably perhaps only if we did so, it would become feasible to find (for example) that the subjective US poverty line and what is widely considered rural poverty in South America are actually above Cusp 2, or even 3 (in Fig. 1).

Equally though, the data might show that perhaps they are not. If we take the literature on happiness for example, a key distinction is drawn conceptually, between happiness as a state at any given moment (termed 'hedonic'), and happiness which is more trait-like, linked to life conditions in general (termed 'eudaimonic'). One can be happy in the moment, but unhappy with life conditions in general. An integrative review of data from successive World Values Reports found

that "people distinguish between happiness in the moment (like being with friends), and happiness (or unhappiness) about and happiness as a judgment about the quality of life as a whole" (Hall and Helliwell 2014, p. 2). Further, those respondents living in the face of extreme poverty have reported relatively low levels of satisfaction with life in general, i.e., eudaimonically (ibid). Figure 1 is focused more on the eudaimonic rather than hedonic. This means that people living in poorer residences may often, in principle, be quite happy in the moment, but generally still find life a struggle, with an overall quality of life they themselves describe as unhappy.

Figure 1 goes further than happiness, however. As we have seen, it includes in theory any indicator of quality of life, from general physical and mental health, decent work, social protection and inclusion, and indicators across all 17 of the SDGs (above). The concept of a SSPL itself suggests that all of them may subtend not just at the macro level of UN SDGs, which are frequently aggregated to national levels or higher, but also at everyday micro, down-to-earth individual and household unit levels. Furthermore, because quality of life is a holistic judgment, we might also find that the point(s) at which, or range in which, there is any felt shift in quality of life is quite comparable across *different* indicators (of divers facets in everyday quality of life).

What about Cusps 2–3 in Fig. 1? Rising to Cusp 2 may bring aspirations for a better quality of life, perhaps higher than incomes themselves allow (Alinsky 1971). As a result of such lags, people may start to sense some relative deprivation—even though in absolute terms their income has actually gone up (Stouffer et al. 1949). Using Fig. 1 as a metaphor, people may turn from looking back at the poverty trap (from which they have just escaped), to look upward at the remainder of the income hill (to the right of Cusps 2 and especially 3). Additionally, when people reach Cusp 2, for example by finding a job with a modicum of disposable income, they may find themselves being targeted by predatory debt industries with specific marketing thresholds of their own, as in South Africa (Hodgetts et al. 2020). The pause in Fig. 1 may thus in part reflect new debt, which may become a second form of poverty trap.

Early results

To date, the predictions in Fig. 1 have only been tested in work settings, using wages as the form of income and quality of work life, including work–life balance, as criteria. Caveats aside, the pattern of flat–rise–pause–rise in Fig. 1 nonetheless emerged across a range of standard indicators from job and life satisfaction to work engagement and sense of justice, as a function of wages and income, personal and/or household, in New Zealand and South Africa (Carr et al. 2018). Cusp 1 tended to emerge near

to legal minimum wages in both countries, with Cusp 2, in monthly income, using purchasing power parity dollars (PPP\$) = 2000 ± 200, which approximated the campaign Living Wage in each country (ibid, this journal). This value was higher on a pro rata basis than either conventional \$1.90 or \$3.20/day PPP\$ for 'extreme' or 'moderate' poverty, respectively (Carr et al. 2018). In the studies conducted and reported to date, a further inflection, akin to Cusp 3 in Fig. 1, has also been found (Carr et al. 2017, 2018, 2019). Furthermore, in each country, Cusps 1, 2 and 3 and the shape of the curve were largely independent of the specific quality of work–life measure that had been reliably measured.

Quantitative, non-linear regression techniques and qualitative content analysis of subjective quality of life have also more recently been integrated to identify any moderating influences (on the curve in Fig. 1). These included number of household dependents and amount of household net of personal income buffering low personal wages (Cheung and Chou 2016). The former (tested in New Zealand) did not alter the sigmoidal, poverty-trap curve; the latter did, but neither changed the fundamental point(s) of inflection (Carr et al. 2019). Societal inequality, as captured by the Gini coefficient, was linked to a steepening of gradients in Fig. 1, but not to any changes in overall shape or thresholds, when the latter were calculated using purchasing power parity dollars (Carr et al. 2018).

Implications and recommendations

The main implication from this article is that current metrics for assessing poverty may be out of touch with experiences of everyday life (Stiglitz et al. 2019). To address that doubt, it is recommended to utilize multiple indicators of quality of life, as well as income. This would allow for the possibility that the poverty range is the same, or in a similar range, for all facets. It is also recommended that the resulting estimates be compared to traditional econometric estimates. This would enable harmonization rather than fragmentation of anti-poverty interventions and evaluations, and convergent validation in sustainability science. It is further recommended that narrative data are used to further articulate the experiences of people at different points in the curve, and to identify factors that actually—subjectively—buffer versus exacerbate hardship. Straddling number and narrative, our wider point is that the *process* for finding subjective poverty thresholds, and ranges in between, can and should be implemented in context, through more accountable, people-centered *sustainability science*.

Conclusion

The way we measure poverty has evolved in at least two main and largely separate directions, one by considering access to other materials as well as money, and the other by considering what people value in their subjective well-being. This paper connects the two, with the former largely[1] being an enabler of the latter. More importantly, the paper also argued that *relationships* between the two are pivotal to gauging human development, when charting pathways out of poverty traps. To operationalize that pivot, monetary metrics are still important, succinct and useful. Specifically, a more humanized approach starts with considering what transformation in quality of living different levels of income and the materials they can buy literally afford *nearer the base of the pyramid* (United Nations Development Programme 2014). Any cusp in the relationship between quality of life, from negative to positive, can then help define a transformation point, or more accurately perhaps pivotal/ing range, in purchasing power parity (PPP) dollar terms.

This approach would also allow for multiple indicators of quality of life to be considered along the quality of life spectrum. In principle, these could span all or any of the SDG indicators, for instance from securing access to decent nutrition (e.g., Veldhuizen et al. 2020), health care (Hone et al. 2018), education (Avelar et al. 2019), to decent work conditions (Parkes et al. 2017), in organizations (Rosati and Faria 2019), social security (Morton et al. 2019), sustainable production/consumption (Gunawan et al. 2020) and protection for the environment (Quinlivan et al. 2020). Measured along diverse but interconnected and potentially aligned PPP\$ income spectrum, these and others are all aspects of the United Nations (UN) Sustainable Development Goals (SDGs). Quality of life trajectory can thus be *psychologically* assessed across time, for individuals and households, neighborhoods and, potentially, nations.

Since this article was first submitted, the world has undergone the COVID-19 global pandemic. Such seismic events will likely set us back on many of the improvements made under the current SDGs (United Nations 2020). In a post-COVID-19 era, knowing the income thresholds and/or ranges at which people subjectively tend to report shifts in everyday quality of life is even more crucial than it was pre-COVID-19. Without crossing those stepping stones to freedom from poverty, and working poverty, global goals to eradicate poverty in all its forms, everywhere, may lose their footing and hard-won momentum.

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[1] The relationship is bi-directional. Health and well-being for example can affect the capacity to earn income.

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