Chronic and late poverty as the main concerns

in a twofold survey on intertemporal poverty preferences

Abstract. The increasing attention gained by the intertemporal aspect of poverty has led to the flourishing of measurement tools which are informed by conflicting views on deprivation dynamics. We test individual preferences for alternative intertemporal poverty patterns using primary data from a sample of 1,083 undergraduate students and a heterogeneous sample of 310 adults in the Dominican Republic. For both samples the strongest concerns are chronic (rather than intermittent) and poverty in the second rather than in the first part of one's life. Preferences are significantly affected by a duration-based between-subject randomly assigned treatment. Individual characteristics such as age and standard of living are significant predictors of respondents' views.

1. Introduction

The dynamic element of poverty has become a major concern for policymakers and a key area in international development –see, inter alia, Hulme and Shepherd (2003), Addison, Hulme and Kanbur (2008) and Barrett and Constas (2014). This has led to the compilation of richer panel datasets as well as to the development of pseudo-panel methodologies (e.g. Dang et al. 2014 and Israeli and Weber 2014), as well as to the study of the chronic and of the transient components of poverty (e.g. Ward, 2016). Parallel to the enhancement of data availability and to the refinement of empirical approaches for the study of movements in and out of poverty, a quickly

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growing body literature[1] has engaged with the search of tools able to provide an evaluation of poverty over time –*intertemporal poverty*. The novelty of intertemporal measurement is the use of snapshots of poverty *at* different times to produce figures quantifying the 'stock' of poverty experienced *over* a certain time frame. For example, rather than comparing two individuals or societies in terms of poverty levels at given years, these are compared in terms of the amount of poverty experienced on the whole over T years. Collapsing poverty data for multiple periods into an aggregate figure has the advantage of guaranteeing a clear-cut judgement as to which society has experienced more poverty, or whether poverty has increased or decreased, whereas a year-by-year comparison would provide a definite ordering only in the case that one distribution stochastically dominates the other –i.e. if a certain society has been poorer than another in each of the T years. However, the assuredness bought through aggregate indicators comes at the cost of losing information and adding the arbitrariness inherent in the aggregation criteria informing the chosen index.

In order to quantify intertemporal poverty one has to take into close examination the pattern of occurrence of poverty spells –an issue which also informed the influential work of Bane and Ellwood (1986). In particular, the analyst has to face a number of dilemmas regarding the distribution of poverty spells. For example, consider four individuals a, b, c and d who all have lived T years and, although each of them has been poor for $T/2$ years in their lives, the distribution of years in poverty was

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[1] Hoy and Zheng (2006, 2011), Foster (2009), Hojman and Kast (2009), Mendola, Busetta and Milito (2011), Bossert, Chakravarty and D'Ambrosio (2012), Calvo and Dercon (2009), Christiaensen and Shorrocks (2012), Gradin, Del Rio and Cantó (2012), Hoy, Thompson, and Zheng (2012), Mendola and Busetta (2012, 2013), Zheng, B. (2012), Dutta, Roope and Zank (2013), Foster and Santos (2013), Hoy and Zheng (2014) and Bresson and Duclos (2015).

different. Individual *a* was poor during the first part of her life while *b* during the second part; which of them has experienced more intertemporal poverty? Individual *c* was poor every other year while for *d* the years spent in poverty were consecutive; again, which of them has experienced more intertemporal poverty? According to the *Early Poverty* and *Chronic Poverty* principles originally developed by Hoy and Zheng (2011) the answers to these questions would point to individuals *a* and *d*: years in poverty count more if they are consecutive rather than interspersed by periods of affluence and if they occur at the beginning rather than at the end of one's life.

This is the first paper eliciting individual preferences for alternative intertemporal poverty patterns. In addition, this is also the first paper which involves in the discussion around the desirability of poverty measurement principles respondents other than university students, and in particular respondents with very low standards of living. Importantly, involving a more heterogeneous sample enables the study of how individual characteristics such as age, education, number of children and standard of living are associated with alternative views. We use primary data collected from two non-probability samples in the Dominican Republic: i) 1,083 undergraduate students from Universidad Autonoma de Santo Domingo, whose views were elicited by means of short questionnaires administered by one of the authors in supervised classroom sessions during lecture time, and ii) a highly heterogeneous sample of 310 adults, addressed through structured interviews carried out directly by one of the authors without the use of interpreters. We find that for both samples the main concerns are chronic (rather than intermittent) and late (rather than early) poverty. As we argue in our conclusions, our results suggest the need for intertemporal evaluation to distinguish between *moment utilities* and *events*

generating utilities as indicated by Kahneman and Riis (2005). In addition, the random allocation of 'twin' versions of our student questionnaire enables us to show that the support for both principles is significantly affected by a duration-based between subject treatment –i.e. the level of agreement with these principles varies according to the length of the poverty spell. Potential determinants of individual preferences are explored through probit models which employ an interaction term between age and standard of living.

The remainder of the paper is organised as follows. In Section 2 we first introduce the intertemporal poverty measurement framework and then we discuss the content of the chronic-poverty and early-poverty views in Subsections 2.1 and 2.2, respectively. Our methodological approach and details about our two samples is presented in Section 3. Results are presented in Section 4; in particular, the analysis of the student sample is provided in Subsection 4.1 and that of the heterogeneous sample in Subsection 4.2. Section 5 presents the main limitations of this study and Section 6 concludes, pointing to the need of further work expounding the different facets of the phenomenon of poverty over time and our concerns about it.

2. Intertemporal measurement principles to be tested

Let the vector $y_i = (y_i^1, y_i^2, ..., y_i^T)$ describe the intertemporal income or consumption profile for the ith individual over T time periods. Given a poverty line $z > 0$, the poverty level of the ith individual in period t is quantified by the individual poverty function $p_i^t(y_i^t; z)$, with $p_i^t = 0$ if $y_i^t \geq z$ and $p_i^t > 0$ otherwise (for the sake of expositional simplicity, we take z to be invariant over time). By arranging in chronological order the values of p_i^t for the T time periods we obtain individual i's

intertemporal poverty profile $p_i = (p_i^1, p_i^2, ..., p_i^T)$, that is, a vector describing the poverty levels of individual i throughout the T periods of interest. To give an example, if we set T at the level of the average life expectancy in developing countries (United Nations, 2013) we would have a sort of individual i's 'lifetime' poverty profile $p_i = (p_i^1, p_i^2, ..., p_i^{60})$. Individual i's intertemporal poverty profile is the basis for the quantification of her intertemporal poverty; this is calculated through the index $P_i^T(p_i)$ which combines poverty figures for each of the T time periods into an aggregate figure.

A number of criteria have been proposed for the aggregation of time-specific poverty levels p_i^t into the intertemporal poverty figure P_i^T. In this paper we explore perspectives around two important principles, the so-called *Early Poverty principle* and the *Chronic Poverty principle*. These principles concern the distribution and the interrelations between p_i^t values in individual i's intertemporal poverty profile; in other words, they are criteria which affect the way p_i^t values are aggregated to obtain the intertemporal poverty index P_i^T. The two principles are described below.

2.1 Chronic Poverty principle (CP)

Let the intertemporal poverty profiles $p_i = (p_i^1, p_i^2, ..., p_i^T)$ and $p_j = (p_j^1, p_j^2, ..., p_j^T)$ be identical in all respects other than the fact that while the π periods spent in poverty by individual i are consecutive, the π periods spent in poverty by individual j are not. This is equivalent to say that in the second vector (p_j) the nonzero

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elements are interspersed by zeros, while in the first vector (p_i) they are contiguous. The *CP* postulates that in this case $P_i^T(p_i) > P_j^T(p_j)$.

The intuition behind the *CP* is appealing, namely that the interruption of poverty spells with periods out of poverty has an alleviating effect on the individual. This idea is highly intuitive and builds upon the importance attributed in the literature to the chronic component of poverty –see, inter alia, Jalan and Ravallion (2000), Duclos, Araar and Giles (2009), Clark and Hulme (2010), Wana and Zhang (2013), Barrett and Carter (2013). On the basis of these insights, a number of contributions adopted properties which lessen the weight attributed to spells in poverty if these are interrupted by periods out of poverty. The general motivation being the same, this has been done in slightly different ways. While Bossert, Chakravarty and D'Ambrosio (2012) and Dutta, Roope and Zank (2013) take contiguity and an either/or condition, Hoy and Zheng (2011), Hoy, Thompson, and Zheng (2012), and Mendola, Busetta and Milito (2011), Mendola and Busetta (2012, 2013) allow for higher intensities of periods in poverty the closer they are –Hoy and Zheng (2016) define the former formulation as *Strict Chronic Poverty principle*. In addition, Dutta, Roope and Zank (2013) account for the mitigating impact of affluent periods preceding the poverty event by discounting the latter by the number of affluent periods directly preceding it; the implication is that even in the case of only one period spent in poverty, two individuals are subject to a different intertemporal poverty evaluation if (ceteris paribus) this has occurred at different times in their lives.

While it is certainly reasonable to think that intermittent periods of affluence would grant some respite from the anguish of poverty, a different view is held by Foster (2009) and Foster and Santos (2013). They propose the *Time Anonymity* and *Time Symmetry principles*, respectively, which do not distinguish between alternative distribution of periods in poverty and periods out of poverty. This stance is similar to the one taken by the seminal contribution of Rodgers and Rodgers (1993). There are also potentially valid reasons to postulate that, the number of periods in poverty being the same, a pattern of periods in and out of poverty is actually worse than being consecutively in poverty, as is the case for the *Loss Aversion principle* introduced into the poverty measurement literature by Hojman and Kast (2009). The existence of psychological mechanisms such as adaptation, recalibration of one's standard of living and loss aversion may suggest that a continuous in-and-out of poverty may actually be more detrimental to the individual –Kahneman and Tversky's (1979), Frederick and Loewenstein (1999), Chapman (2000), Di Tella, Haisken-De New and MacCulloch (2010) and Frijters, Johnston and Shields (2011). In the context of intertemporal poverty measurement, this would suggest that the loss experienced due to falling below the poverty line outdoes the gain accrued for escaping poverty; and as a consequence, the net effect on the individual would be worse in the case of intermittent rather than consecutive periods in poverty. The improvement vs worsening asymmetry is also evident in the significantly larger support for the customary Monotonicity Axiom in poverty measurement when this is presented in the form of decreasing poor incomes rather than increasing poor incomes (Esposito and Majorano, 2011). As we mentioned in the introduction, some unease with the idea behind the *CP* can also be phrased in terms of adaptation; if people adapt to a situation of deprivation, then hardship may be lower if periods in

poverty are consecutive. In the words of Clark (2009) "Indeed, given the large number of chronically poor and severely deprived people in the world, it is only prudent to wonder how much suffering and misery there would be in the absence of adaptation" (p. 23).[2]

2.2 Early Poverty principle (EP)

Let the poverty profiles $p_i = (p_i^1, p_i^2, ..., p_i^T)$ and $p_j = (p_j^1, p_j^2, ..., p_j^T)$ be identical in all respects other than the fact that while the π periods spent in poverty by individual *i* occurred in the first part of her life (i.e. over the time frame $[0, 1, ..., T/2]$), those spent by *j* occurred in the second part of her life (i.e. over the time frame $[(T/2)+1, (T/2)+2..., T)]$) $-T$ taken to be an even number. This is equivalent to say that for p_i the nonzero elements occur in the first part of the poverty profile vector, while for p_j they occur in the second part. The *EP* postulates that in this case $P_i^T(p_i) > P_j^T(p_j)$.

The *EP* has a central role in the contributions by Hoy and Zheng (2011) and Hoy, Thompson and Zheng (2012). The intuition behind it is that poverty experienced in early stages of one's life should receive more weight because it has physiological and psychological effects on the individual, which are detrimental for future outcomes. Early poverty worsens employment prospects and decreases the ability to generate consumption in the future (Duncan, Ziol- Guest and Kalil 2010 and Dickerson and Popli 2016). In addition, early poverty jeopardises adult health (Conroy, Sandel and

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[2] It is worth noticing that the existence of the adaptation mechanism is advocated by Amartya Sen as one of the motivations for the development of his Capability Approach. Due to the adaptation, the poor would enter what he calls 'physical condition neglect' (1985, pp. 21-22) and underestimate the harshness of their situation.

Zuckerman 2010), impairs neuro-cognitive development (Farah et al 2006, Evans and Schamberg 2009) and reduces academic achievements (Victora et al 2008, Hair et al 2015). This evidence suggests that a number of future outcomes (education, health, employment, etc.) are harmed by poverty occurring early in life, and because of this effect early poverty spells can be seen as having a greater impact compared to poverty occurring later in life. A potential objection to attaching more importance to early poverty spells for this reason is that future reduced achievements in education, health, etc. would appear in the data; the adoption of multidimensional poverty measurement techniques would quantify the losses which have concretely occurred. However, while this is in principle true, there are likely to exist unobservable social, psychological, cognitive and health-related effects from early poverty which would not be picked up even from a rich multidimensional data set. The desirability of attributing greater importance to early poverty spells therefore partly depends on which data are available as well on the context in which lifetime poverty is measured. On a more conceptual level, a further difficulty for multidimensional poverty measurement in accounting for the detrimental future effects of detrimental of early poverty spells is that the dimensions which would need to be included in the evaluation are not only intertwined with each other, but they are also qualitatively different from each other. For example, some are resources (e.g. consumption) while others are more direct expression of wellbeing (e.g. health).

While, as we saw, there are strong reasons for weighing more highly poverty experienced early in life, giving a back seat to poverty in the last part of people's lives may conflict with other considerations. For example, deprivation could take a greater toll in older age when the individual is frailer, and physical fitness has smaller scope for tempering the harshness of poverty. This feature of older age could

nevertheless be accounted for by making the poverty line an increasing function of age, so that it is revised upward for older people, or by including in multidimensional analysis further dimensions able to detect specific problems older people must cope with. Reasons for highly valuing poverty in older age may be also found in the feeling of hopelessness and the sense of failure which are likely to arise in the individual who ends up living in poverty the final part of her life, and in the evidence that in intertemporal evaluations individuals typically attribute a large importance to the end moment –see Kahneman et al (1993) and Kahneman and Thaler (2006). Hoy, Thompson and Zheng (2012) acknowledge how tough poverty can be later in life and put forward the idea of a U-shaped pattern, with poverty being worse at early and late stages in life.

Other recently proposed intertemporal poverty measurement frameworks also incorporate properties which bring about an unequal evaluation of experiences of poverty occurring at different points in one's life; however, these properties are motivated on different grounds. Imagine two three-period scenarios where individual i is poor in one period and nonpoor in the other two periods; in the first scenario she is poor in period 1 while in the second scenario she is poor in period 3. Clearly, individual i is younger in period 1 than she is in period 3. For Dutta, Roope and Zank (2013) intertemporal poverty would be larger in the first scenario; however, this verdict does not originate from age-related concerns, but is down to the lower mitigation potential offered by affluent periods in the case of the first scenario. The opposite ranking between the two scenarios is determined by the Mendola and Busetta (2012) framework; however, again, their *Late Poverty principle* underpinning the decay factor they use in their index is introduced with the aim of

attributing more importance to more recent periods in poverty rather than to periods in poverty experienced in older age.

3. Methodological approach

Previous research eliciting individual views around poverty measurement principles has been confined to surveys carried out with university students approached in supervised sessions during lecture time –see Amiel and Cowell (1997) and Esposito and Majorano (2011). While this approach is very handy because it allows researchers to easily reach a large number of respondents able to answer complex questions thanks to their level of literacy and numeracy, at the same time it only offers perspectives on the beliefs under study held by a minority of the population. In this paper we extend this approach by testing the intertemporal poverty principles described above through not only a survey with university students (n=1,083), but also interviews with a more heterogeneous sample in terms of demographic and socioeconomic background (n=310). While we were unable to adopt probabilistic sampling strategies due to resource constraints, our aim is to gain richer evidence using different samples and methodologies. In addition, the more heterogeneous sample enables us to explore the predictive role of variables which typically offer little variation in student samples such as age, standard of living, education, having children, etc.

Student sample. 1,083 questionnaires were administered to undergraduate students by one of the authors in supervised sessions during lecture time. The data collection took place at Universidad Autonoma de Santo Domingo (UASD, the main public university in the capital city) across four disciplines –Architecture (269), Education

(251), Law (308) and Medicine (255). The development of the questionnaire benefited from inputs offered by academics in the School of Education at UASD and the questionnaire was piloted with a small student sample to ensure that the wording was clear. In the final survey response rate was around 96% and occasional ex-post interviews carried out with respondents reassured about the understanding of the questions posed. The support for the poverty principles under study is tested by eliciting direct preferences for pairs of alternative deprivation patters; for example, respondents are asked to state whether they would prefer to spend a given number of poverty spells consecutively or to alternate periods in and out of poverty.[3] This simpler formulation was preferred to more complex ones to keep the questions as similar as possible across the student and the heterogeneous samples −with the latter, more complex methods such as the use of third-person vignettes and/or the quantification of the harshness of alternative patterns through Likert scales proved to be concerning (we expand on this in Section 5).

We exploit the large size of the student sample to test for the sensitivity of responses to the duration of the poverty spells; in other words, we test whether the support for the two intertemporal poverty principles under study differs according to the duration of the time spent in poverty. For this purpose, two versions of the questionnaire were developed which were identical in everything other than the duration of the poverty spell (see questions in appendix, Section A0). The *½ life* and *5-year* versions of our questionnaire were allocated through a between-subject design −each student was presented with only one version. In each classroom the questionnaires were

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[3] The notion of poverty is deliberately left vague in order not to let responses be biased by idiosyncratic views on constituents of poverty. As was the case for 'serious injury' in Jones-Lee, Hammerton and Philips (1985) and 'basic needs' in Corazzini, Esposito and Majorano (2012), by allowing heterogeneity in individual understandings of poverty (a respondent is left free to interpret it as lack of food and another as lack of shelter) we avoid that responses become affected by unobservable heterogeneity across respondents in the sensitivity to specific aspects of poverty.

dispensed in a chessboard-like distribution of the two versions, the result being that each version was allocated to a randomly selected half of students –the null hypothesis of a significant difference between the two subsamples is rejected for all socio-demographic characteristics, results are available in appendix, Sections A1 and A2. The main characteristics and family background of the student sample are described in Table 1.

[Table 1 about here]

Heterogeneous sample. 310 structured interviews were carried out directly by one of the authors without the use of interpreters. Also in this case, the development of the questionnaire benefited from piloting and from inputs from local academics with fieldwork experience in the School of Education at UASD. Differently from the student sample, no experimental design was implemented here and views on the two intertemporal poverty principles were elicited within a ½ life temporal frame. The data collection was carried out with the aim of achieving substantial demographic, socio-economic and geographic heterogeneity. Interviews took place across two urban and two rural locations (the two main cities, Santo Domingo and Santiago, and two rural areas in the North and South-East of the country). Respondents aged from 18 to 79, 53% were female and number of children ranged from 0 to 13. Educational levels, expressed in years of schooling, ranged from as little as 0 years of schooling (11 respondents) to 18 (5 respondents owned postgraduate degrees), with mean and median around 10 years of schooling –respondents with a university degree were around 10% against a national figure of about 9% according to the 2010 census (ONE, 2013). Standard of living in this sample varied considerably –personal income ranged from 700 to 70,000 Dominican Pesos (around 1,500US Dollars), and in terms

of durable good possessed 26 respondents owned both a computer and air conditioning while 41 owned neither a fridge nor a washing machine.

4. Results

4.1 Student sample

Table 1 shows strong support for *CP* and weak support for *EP*. Panel 1 refers to our student sample and indicates that, overall, 3 out of 4 students agree with *CP* but only 1 out of 6 agrees with *EP*. These overall figures hide important differences across the *½ life* and *5-year* questionnaire versions. While the general pattern of strong agreement with *CP* and weak agreement with *EP* remains for both versions, the different time frame brings about a substantial difference in respondents' views. The support for CP is 80.91% among students who received the *½ life* version and 68.31% among those who received the *5-year* version. Corresponding figures for EP are 12.74% and 19.27%. For both principles, the difference between two versions is significant at any customary significance level ($p<0.01$, two-group test of proportion).

[Table 1 about here]

It can be noticed that the treatment effect acts in opposite directions for the two intertemporal principles. The support for *CP* is stronger for the *½ life* than for the *5-year* version, suggesting that the agreement with *CP* may increase with the duration of the poverty spell. This reflects the intuition that coping with consecutive periods is harsher the longer the poverty spell –i.e. the longer the poverty spell the more likely the 'exhaustion' effect is to prevail over the adaptation mechanism. The agreement with *EP* is instead weaker for the *½ life* than for the *5-year* version. Presented with

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the choice between experiencing a poverty spell in the first or in the second half of their lives, our respondents were less likely to choose the latter if the poverty spell embraced only five years. In other words, the agreement with the idea of poverty being worse in the first part of one's life, while still low, is larger if the poverty spell covers only a fraction of it.

In Table 3 we carry out multivariate analysis through probit models where the dependent variable takes a value of 1 if the respondent agrees with the principle and a value of zero otherwise. In specification 1 and 3 our explanatory variables are those described in Table 1; in specifications 2 and 4 the absolute and relative subjective economic status variables are replaced by a variable combining them. Overall model statistics are reassuring and indicate the ability of the model to correctly classify around 80% of responses. In all our specifications the treatment effect is highly significant ($p<0.01$), confirming the effect of the duration of poverty spells on the degree of support to the principle. Respondents' age is significantly associated with their views ($p<0.05$), with older students more likely to support the axioms. While this result should not be overstated since students' age range is rather limited (85% of our student sample are below 30 years old), it is interesting that, among a highly educated sample, age (and possibly maturity) is positively associated with the principles under study. We find a highly significant gender effect in supporting CP, with females being more likely to be concerned with consecutive poverty spells. The evidence on gender difference with regard to pain tolerance and endurance may provide clues in this respect. The literature points to physiological mechanisms and learned psychosocial gender role-based dynamics which contribute to females' lower tolerance of prolonged experience of pain as well as increased anxiety towards the prospects of a protracted condition of suffering (Wise et al 2002, Sarlani et al 2004).

Finally, we investigate the potential role of perceived economic status. In specifications 1 and 3 there is some evidence, although weak, of a positive association between perceived economic status and the support for *EP*. Since the perceived economic variables are highly skewed (very few respondents chose top categories), we build a more evenly distributed variable by summing up the two variables in a variable called Abs+Rel. We then generate dummy variables referring to quintiles of these variable and include them in specifications 2 and 4. While these more balanced dummies are empirically convenient and can be seen as informative on the two aspects of subjective economic status, it should be kept in mind that such manipulations of ordinal data are highly problematic for the cardinality assumptions they rely on and for their implications in terms of construct validity –see Witkowski et al (2002) for a discussion. The dummy variables are highly significant (for three of them $p<0.01$ and for one $p<0.1$), suggesting a positive association between standard of living and agreement with *EP*. We see two interrelated ways of interpreting this result. Students in families with low socio-economic status may be more sensitive to the anguish suffered by older family members in a context of scarcity of resources, while students in families with higher socio-economic status may be more aware of the importance of a childhood without poverty, from which they have possibly benefited. This line of reasoning assumes that there is a correspondence between subjective and objective economic status, which we cannot test with our data and which, however, some research has showed to be often weak (Ravallion and Lokshin, 2002 and Carletto and Zezza, 2006). In addition, students with perceived low socio-economic status (whether this is real or not) may feel more vulnerable and less able to count on financially secure extended family, and this may increase their concern with the idea of poverty in the second part of their lives.

4.2 Heterogeneous sample

The second panel of Table 2 suggests that also our interviewees agree substantially

with CP but are not convinced by *EP*. The agreement with *CP* and *EP* expressed by

our heterogeneous sample is, respectively, 74.34% and 13.27% –the relevant

comparison figures are those for the *½ life* version of our student sample,

respectively, 80.91% and 12.74%. In Table 4 we present the analysis of individual

characteristics as predictors of views on intertemporal poverty dynamics.

Multivariate analysis is carried out again using probit models where the dependent

variable takes the value of 1 if the respondent agrees with the principle and zero

otherwise. We present results only for *EP* since no particularly clear pattern emerges

from the analysis of *CP* –results are available upon request. We include a number of

regressors to control for socio-economic characteristics of the respondents. Our

regressors are a gender dummy (1 if female, zero otherwise), the level of education

of the respondent as well as that of her mother and of her father (all educational

variables are expressed as years of formal schooling), number of people in the

household, marital status dummy (1 if married, 0 otherwise), occupational status

dummy (1 if employed, 0 otherwise), religion dummy (1 if catholic, 0 otherwise),

experience of major illness dummy (1 if married, 0 otherwise) and dummies for the

different locations where the data collection took place. Overall model statistics are

again reassuring and indicate the ability of the model to correctly classify around

90% of responses.

We explore the predictive role of standard of living using both income and wealth. In

particular, specifications 1 and 2 employ the logarithm of monthly individual wage

income while specifications 3 and 4 use a simple indicator of household wealth (a

count variable representing the number of durables possessed).[4] Since the correlation between income and wealth indicators is moderate (0.46), we also present specifications 5 and 6 which employ both variables. Specifications 1, 3 and 5 include no interaction terms while in specifications 2, 4 and 6 age is interacted with standard of living indicators. Estimation and post-estimation statistics are reassuring about the ability of the models to fit the data; in particular, all models are able to correctly classify around 90% of responses. It can be noticed that in all cases interaction terms are highly significant and models with interaction terms perform better than models without it; this holds for a number of measures of fit displayed, including the Bayesian Information Criterion (BIC) which penalises models for the use of additional regressors.

[Table 4 about here]

The most robust story across specifications 1-4 relates to the role of age and its interaction with standard of living; this holds regardless of whether income, wealth or both are used as indicators of standard of living. The older you are the more likely you are to believe that poverty is harsher in the second part of your life. While it is possible to interpret the stance of older respondents as 'partisan', it is can be also argued that they are also more aware of the greater toll that deprivation may take later in one's life; in a post-interview debriefing, a 49-year-old male respondent justified this view commenting that "when you are not young anymore, as you walk your feet get tired". The positive interaction term between age and standard of living indicators suggests that this role of age becomes weaker for richer respondents. In order to understand the interaction term, however, it is necessary to keep in mind that

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[4] This simple count variable has the limitation that the items summed up do not have the same economic value. However, we believe that it is a useful as an additional variable for standard of living. As we shall show, the main results are common to regressions using income or wealth as an indicator of standard of living.

relying on sign and significance the interaction term can be misleading in nonlinear models, because significance levels as well as sign can differ at different values of the covariates (Ai and Norton, 2003). We follow Greene's (2010) suggestion to recur to a graphical analysis of this interaction by plotting the marginal effects of age at different levels of standards of living. As can be seen in Figure 1, in the case of both income and wealth the (negative) marginal effects of age are significant up to a certain level of standard of living and then cease being significant; this suggests that age is no longer a relevant predictor for respondents living more comfortably. In particular, this seems to happen at an income level about four times the threshold for absolute poverty and greater than the minimum wage; the marginal effects of age are negative and significant up to an income of about RD$8,955, with the national line for absolute poverty and the minimum wage in the country being RD$2,601.75 and RD$6,400 respectively (BCRD, 2011).

[Figure 1 about here]

Our last observations regard the positive (but less consistently significant) coefficients of education and number of children. The former indicates that more educated respondents are more likely to deem deprivation to be harsher in young age, while the latter suggests that this view is fostered by having own offspring. It is rather intuitive that having children increases the sensitivity to poverty experienced earlier in one's life; as to education, it is possible that it increases awareness of the negative consequences hardship in young age brings about upon a number of life domains, as we discussed in Section 2.2.

5. Limitations

A number of limitations of this study should be acknowledged. First of all, there are important aspects of poverty dynamics which were not be addressed. For example, as suggested by Hoy, Thompson and Zheng (2012), the harshness of poverty may be rather severe during childhood and old age, and be less detrimental during adulthood. Our dichotomisation of people's lifespan does not enable us to shed light on this idea. This also implies that while the lack of support for *EP* does provide a strong indication of the importance of late poverty, it may well overlook the particularly important role deprivation plays in the first years of one's life. It is meaningful that older (and presumably more mature) students and more educated respondents in the heterogeneous sample are more likely to support EP. Another example concerns unaddressed nuances in how chronic poverty may be conceptualised. We investigate views around *CP* on the basis of contiguity of poverty spells as a dichotomous characteristic –i.e. two poverty spells contribute to chronic poverty only if they are strictly consecutive (as in Bossert, Chakravarty, and D'Ambrosio 2012). We do not investigate sensitivity to how close (even if not strictly contiguous) poverty spells are, an aspect which instead taken into account (Hoy and Zheng 2011).

Another limitation of this study relates to the inability to shed light on the degree or strength of individual preferences. The questions on intertemporal poverty dynamics posed to our respondents contained two options (e.g. contiguous or alternate poverty spells) and respondents were asked whether they preferred one or the other. The choice of a binary option rather than, for example, polytoumos Likert scales for the degrees of preference or harshness of a certain option was made after carrying out the pilot with the heterogeneous sample. Debriefing exercises carried out after the pilot interviews revealed that the different ordered categories of the Likert scale were

virtually indistinguishable for our respondents with very low education. We hence opted for a simple and clear cut 'would you prefer' question. More detailed questions would have been viable with the student sample, but as this is the first study which goes beyond university students we wanted to keep the questions for the two samples as similar as possible.

An additional limitation originates in the non-probabilistic nature of our samples. Despite our effort in ensuring geographical, socio-economic and demographic heterogeneity, neither the student sample nor the heterogeneous sample were randomly selected from a rigorous sample frame. It follows that our samples cannot be seen as representative of the Dominican student and general populations. This means that our results are not generalisable and have little external validity.

6. Conclusion

The intertemporal aspect of poverty and wellbeing is becoming increasingly prominent in the literature, and a pressing concern for policymakers. New avenues are opened for poverty analysis thanks to the compilation of richer panel datasets, the refinement of pseudo-panel methodologies and the recent development of novel measurement tools. Using two very different convenience samples, we tested preferences for competing views on intertemporal poverty patterns, which inform key principles adopted by the rapidly growing literature on intertemporal poverty. We found strong concerns for chronic (rather than intermittent) poverty, and for poverty occurring in the second rather than in the first part of one's life. An important offer of our paper relates to the experimental design with our student sample. The strong significance of our randomly allocated treatment suggests points

to the duration of the poverty spell as a factor affecting people's beliefs. Finally, our results also indicate the potential role played by socio-economic and demographic characteristics in influencing respondents' views on poverty dynamics –in particular age, standard of living, having children and education.

The evidence we presented in this paper offers valuable insights on people's stated preferences on intertemporal poverty patterns, although the importance of our results should not be overstated given our sampling limitations. Much remains to be understood on how to deal with conflicting judgements informing alternative measurement tools to evaluate poverty dynamics. Future research is needed to shed light on a number of issues, including the idea of a U-shaped weighting of poverty episodes during one's lifetime, the role of the duration of the poverty spells, the heterogeneity of values (and possibly differentiation of evaluation criteria) across subgroups, etc. In doing so, researchers could build upon the existing wealth of knowledge on the psychological and neurological underpinning of intertemporal decisions –e.g. Kable (2013) and Urminsky and Zauberman (2014). More work is certainly needed on the conceptualisation of the 'mesurandum', that is, a theoretical refinement of the variable(s) we want to measure. For example, Kahneman and Deaton (2010) explain the apparently contradictory evidence on the impact of income on subjective wellbeing by conceptually disentangling satisfaction with life and emotional wellbeing. In the context of intertemporal evaluation, Kahneman and Riis (2005) warn against the failure to distinguish *moment utilities* from the *events* that give rise to those utilities –i.e. claiming that the order in which events occur matters for total utility is different from claiming that the order of utilities matters. In a similar fashion, future research should aim to break free from the straightjacket of the current one-concept impasse and distinguish between present harshness due to

being poor (probably tougher during old age) and future consequences of being poor (particularly harmful during childhood). Given the importance of a better understanding and measurement of intertemporal poverty, for academia and more so for the wider community, this is a key task for future research.

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APPENDIX

A0) Questions eliciting intertemporal preferences in the two randomly allocated questionnaire versions

Between-subject design with subjects randomly allocated to treatment. The questions testing intertemporal poverty principles read as follows:

Chronic Poverty Principle

i) ½ life version
If you had to spend half of your life in poverty and half out of poverty, would you prefer:
□ to spend the years in poverty in a consecutive way
□ to alternate the years in poverty with years out of poverty

ii) 5 years version
If you had to spend 5 years of your life in poverty and the rest out of poverty, would you prefer:
□ to spend the years in poverty in a consecutive way
□ to alternate the years in poverty with years out of poverty

Early Poverty Principle

i) ½ life version
If you had to spend half of your life in poverty and half out of poverty, would you prefer:
□ to spend in poverty the 1st half of your life
□ to spend in poverty the 2nd half of your life

ii) 5 years version
If you had to spend 5 years of your life in poverty and the rest out of poverty, would you prefer:
□ to spend the years in poverty during the 1st half of your life
□ to spend the years in poverty during the 2nd half of your life

A1) Randomization check

Below are the tests for the null hypothesis of a significant difference between the two subsamples –socio-demographic characteristics referred to in Table 1, Panel 2. Null hypothesis rejected in all cases –full STATA output reported (test of proportions, t-test, chi2 test and Wilcoxon Mann Whitney test performed depending on the nature of variables and normality of their distributions).

**Table A1. Rejection of the null hypothesis
of a significant difference between the two student subsamples**

Binary variables	*p-value (test of proportions)*
Female	.5214
Architecture degree	.8200
Law degree	.8167
Medicine degree	.6221
Education degree	.6098
Continuous variables	*p-value (t-test)*
Age	.9614
Semester of study	.4204
Ordinal variables	*p-value (Wilcoxon-Mann-Whitney rank-sum test)*
Mother's education[a]	.3976
Father's education[a]	.2714
Absolute[b]	.4045
Relative[c]	.3922

[a]Parents' educational achievements, ranging from 1 for complete absence of formal schooling to 8 for postgraduate degree.
[b]Perceived family income on a 5-point Likert scale from 'Very low' to 'Very high'.
[c]Perceived family standard of living compared to other families on a 5-point Likert scale from 'Much lower' to 'Much higher'.

A2) Further randomization check

We provide an additional check confirming that randomization was successful. A module on wellbeing was also identical across the two versions and fully randomised – see tests below confirming again rejection of the null hypothesis as shown above, also by wellbeing subsample.

Table A2. Additional check: Rejection of the null hypothesis
of a significant difference between the two student subsamples

	Wellbeing A	Wellbeing B
Binary variables	*p-value (test of proportions)*	
Female	.9604	.3922
Architecture degree	.9794	.7685
Law degree	.8796	.8604
Medicine degree	.6235	.8353
Education degree	.5236	.9243
Continuous variables	*p-value (t-test)*	
Age	.5274	.5483
Semester of study	.9582	.2243
Ordinal variables	*p-value (Wilcoxon-Mann-Whitney rank-sum test)*	
Mother's education[a]	.4586	.6479
Father's education[a]	.4355	.4754
Absolute[b]	.6443	.4706
Relative[c]	.2023	.9503

[a]Parents' educational achievements, ranging from 1 for complete absence of formal schooling to 8 for postgraduate degree.
[b]Perceived family income on a 5-point Likert scale from 'Very low' to 'Very high'.
[c]Perceived family standard of living compared to other families on a 5-point Likert scale from 'Much lower' to 'Much higher'.