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SUBJECTIVE WELL-BEING AND INTERGENERATIONAL MOBILITY
IN SOUTH AFRICA:
RESULTS USING THE NATIONAL INCOME DYNAMICS STUDY

By

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Thesis

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Subjective Well-Being and Intergenerational Mobility in South Africa

Chairperson: Douglas Dalenberg

Abstract:

Using data on individuals from the National Income Dynamics Study (NIDS), this paper analyzes the relationship between intergenerational mobility and subjective well-being for two cohorts of South Africans. Subjective well-being has been measured using a multitude of factors, but the impact of changing economic mobility on reported life satisfaction has been less explored in the context of South Africa. Education and social mobility are the two mobility variables used to understand how changes in economic status relative to one's parents affect self-reported well-being. This paper utilizes three methods of regression analysis for comparisons: cross-sectional, pooled cross-sectional, and panel (fixed effects and random effects methods). Estimates from each of these models indicate a positive effect of upward social mobility on reported well-being, however the effect is larger for the apartheid cohort (older average age) compared to the post-apartheid cohort. The estimates for educational mobility give mixed results across the methods, so findings regarding the impact of educational mobility on reported well-being are less evident. These results suggest that improving one's social mobility status positively impacts life satisfaction in South Africa, but that the magnitude of the effect is smaller for a post-apartheid generation of South Africans.

1. Introduction

The use of subjective well-being measures has become an important method for understanding how people within a society feel overall about their lives. Understanding the determinants of life satisfaction for different groups provides useful insight into the well-being of a community and can better inform decisions about economic policies. For developing countries, alleviating poverty and generating greater opportunities for individuals are core issues that can be addressed through effective policy measures. Particularly in South Africa, efforts have been taken to reverse many of the wrongdoings of apartheid, such as restoring lands, attempting to increase gender equality, and increasing access to healthcare (Worden 2012). However, South Africa remains one of the countries with the highest level of inequality, as explained through their high Gini coefficient (World Bank, 2014).¹ This paper focuses on understanding how changing one's economic standing impacts subjective well-being in South Africa by measuring the impact of intergenerational mobility on reported life satisfaction.

Intergenerational mobility is one approach that attempts to understand how economic measures within a country are changing from one generation to the next. Using indicators such as educational mobility, social standing, or income as measures of intergenerational mobility can provide insight into whether a country like South Africa, which has a long history of restrictive racial development, is improving in terms of

¹ The Gini coefficient measures income inequality within a country. A Gini coefficient of 0 means there is perfect equality in that everyone receives an equal share of income, and 1 means perfect inequality, where one group holds all the income (US Census Bureau, 2021).

economic opportunities or ability to improve one's socio-economic position.

Intergenerational comparisons that compare what younger generations are achieving relative to their parents can be a way to highlight areas of stagnation. With it being approximately three decades since the end of apartheid, it is important to explore whether opportunities to improve economic standing or well-being are improving for South Africans, particularly for Black and Coloured South Africans. Therefore, the research question for this paper is: How does intergenerational mobility impact subjective well-being in South Africa? This will be explored by comparing two groups of South Africans: one that came of working age or likely joined the workforce under apartheid, and another that likely entered the workforce after apartheid ended, in order to understand more about economic mobility and the impact it has on well-being for these two cohorts of South Africans.

This paper uses from the National Income Dynamics Study (NIDS 2023) in South Africa to explore this question. The longitudinal nature of the NIDS allows for the unique opportunity to use panel data within the context of a developing country. Three methods of regression analysis are utilized: cross-section, pooled cross-section, and panel data. Results regarding intergenerational mobility and the determinants of life satisfaction² are compared across each method to identify which method best predicts subjective well-being using this data, with a particular focus on comparisons with panel data methods. The most robust method is then used to observe results from two final regressions that restrict the sample to each individual generation cohort. With the ability to control for

² For the purposes of this paper, the terms “life satisfaction”, “happiness”, and “well-being” will be used interchangeably to explain how satisfied people are with their lives.

unobservable characteristics that do not change over time with panel data, which inevitably slip into data and could potentially confound results, utilizing the panel data was expected to be the best method for the household survey data used in this research. Ultimately, I identified fixed effects as the superior method among the methods (cross-section, pooled cross-section, fixed effects, and random effects).

2. Literature Review

Subjective Well-Being in Developed Countries

Over the past few decades, economic literature has placed more emphasis on identifying determinants of an individual's happiness to understand what makes certain societies better off. Easterlin (1974) paved the way for further research in this area by finding that higher income levels were not necessarily matched with increases in happiness, or life satisfaction, to a similar degree. This highlighted the fact that while economic growth can have benefits for a society, the growth itself does not always directly change an individual's level of satisfaction. To explain that point further, Oswald (1997) provides an analysis of happiness primarily for developed nations and concludes that economic progress only incrementally increases happiness. Diener and Biswas-Diener (2001) construct a review of well-being research and find themes of income positively affecting happiness when it means avoiding poverty, but for middle- or higher-income individuals, the effect diminishes.

The diminishing effect of income is further supported by Di Tella et al. (2003), who use psychological well-being data from 12 European countries and the United States to analyze what impact macroeconomic movements have on happiness. Using country-

and individual-level controls, they find that at the national level, responses to questions about happiness are strongly correlated with changes in current and lagged GDP per capita. While this is evidence that macroeconomic conditions impact the happiness of a country, the authors state that the well-being gains are likely to wear off over time and call for more research focused on long-run impacts. An article by Diener and Oishi (2000) fills that gap in part by comparing differences in reported life satisfaction across 19 different nations by looking at different compositions of income effects (e.g., comparing lowest and highest income groups, comparing top income groups across nations, etc.). They find evidence that wealthy societies, as they achieve higher levels of wealth, do not grow substantially in well-being, and suggest that other pursuits unrelated to money may lead to greater life fulfillment.

One theory that has been proposed to explain the diminishing relationship between income and happiness is hedonic adaptation. Hedonic adaptation occurs when the temporary increase in utility or satisfaction that people experience from consumption wears off or diminishes with continued consumption (Stutzer 2004). The result is a “hedonic treadmill” in which the positive effect of each additional purchase fades as people adjust to them, leading people to return to buy more items to chase that feeling of fulfillment, or to satisfy a desire or thrill (Nikolaev and Burns, 2014). Climbing up the socio-economic ladder may create a similar experience for people as they adjust to their new level of status or wealth. This could partially provide a theory as to why levels of happiness within a country have not paralleled that of rising incomes; adjustment to higher levels of consumption following higher income levels can leave people chasing material desires, without truly improving their overall life satisfaction.

The relationship between income and subjective well-being is nothing short of complex, and comparisons across regions illustrate how well-being is dependent on many situational and cultural factors. On a more microscopic level, findings can also vary based on slight differences in the way subjective well-being is measured. Kahneman and Deaton (2010) highlight two distinguishable channels through which subjective well-being is influenced: life evaluation and emotional well-being. Life evaluation is defined as the thoughts or feelings people have towards their lives, whereas emotional well-being encompasses overall emotional quality, measured by the frequency of feelings that make one's life pleasant or unpleasant (such as anger, joy, sadness, or affection). Using data from the 2008 and 2009 Gallup-Healthways Well-Being Index survey, the authors find that for a sample of Americans, improvements in emotional well-being plateau at an annual income of approximately \$75,000, while life evaluation does not. In other words, Kahneman and Deaton (2010) find evidence that after a certain level of annual income, other circumstantial factors more heavily influence emotional quality, while even beyond a certain threshold, increases in income may continue to impact life evaluation, or the way people feel about their lives. This highlights how slight differences in wording or phrasing of subjective well-being questions across survey methods, such as (i.e., "How happy are you with your life" versus "How satisfied are you with your life") can be enough to capture two different effects that arrive at two different conclusions.

The nuances of measuring emotional well-being were further analyzed in a recent article by Killingsworth et al. (2023). The authors, having published separate articles that found contradictory results regarding the relationship between income and happiness, collaborated to figure out how their research ended up at opposing conclusions.

Killingsworth (2021) found a consistent rise in average happiness with increases in the log of income, while Kahneman and Deaton (2010) found a plateau effect beyond a certain income threshold (about \$75,000). Upon further evaluation, Killingsworth et al. (2023) found a plateau effect of income for the less happy people: happiness rises rapidly for the least happy 15% of the distribution, but flattens at levels beyond \$100,000. In contrast, the happier people in the distribution continued to show increases in happiness beyond an income level of \$100,000 and happiness levels even accelerated above that income level for those who are in the happiest end of the distribution. Together, the authors recognized that their previous research did not consider the changing shape of the happiness distribution as income increases. The authors suggest that for the less happy people, having an income at or greater than the threshold does not resolve issues such as clinical depression, or a higher occurrence of negative affect emotions.

These studies provide an illustration of how research regarding life satisfaction has progressed in developed countries over the past few decades. Research has evolved from understanding how macroeconomic factors impact well-being to combining aspects of other disciplines such as psychology to understand the intricate relationships between economic factors and mental or emotional well-being. The next section discusses some of the research topics that have been focused on in developing countries, with a particular focus on studies in South Africa.

Research in Developing Countries

In both developed and developing countries, the purpose of well-being research is not only to understand well-being, but also to identify what kind of economic

interventions can support a community or improve living conditions. Solutions to certain issues will differ based on location, geography, political, and socio-cultural environments, among other factors. This is one reason why it is necessary to do well-being analysis in developing countries, as effective policy interventions may look different than in developed countries.

To establish a basis for understanding the relationship between subjective well-being and poverty in a developing country, Kingdon and Knight (2007) use data collected by the South African Labour and Development Research Unit (SALDRU) in 1993. They found a positive correlation between income and happiness in South Africa that was nonexclusive; non-monetary factors, such as social factors, also mattered for improving well-being. Recent research has been done to understand how these other factors, which include issues such as crime, migration, family functioning and social capital, race, and unemployment, impact subjective well-being (Fisher et al., 2022; Mulcahy and Kollamparambil, 2016, Clarke and Eyal, 2014; Salnikova, 2019; Ebrahim et al., 2013; Botha and Booysen, 2014). Although these studies move us towards understanding subjective well-being in developing nations, it is important to note that many of these issues impact people living in developed nations as well.

Broader measures such as race, unemployment, education, and access to services are needed in addition to measures of income in well-being research to better understand how the welfare of a society can be improved. Ebrahim et al. (2013) specifically focus on the differences in well-being among race groups in South Africa. Not only did they find that there are large discrepancies in life satisfaction based on race group, but that the determinants of satisfaction differ as well. Some of the main findings are that physical

health was an important determinant for White South Africans, while employment status and absolute income mattered more for Black South Africans. Living in a rural location also meant less satisfaction than in urban areas for Black South Africans. Possibly most notable is that Black South Africans reported lower levels of well-being than other race groups, with satisfaction being even lower for Black South African women. The authors state how this is problematic for attaining social cohesion in South Africa, and that these findings have implications for improving welfare through development policies.

Crime is another factor that can impact well-being, particularly if there is a higher prevalence of crime in a person's geographical location. Fisher et. al (2022) focus on understanding one way that crime impacts happiness in South Africa by specifically looking at how perceptions of crime in rural and urban areas affect well-being. By using all five waves of NIDS to carry out a least-squares dummy variable model as well as an ordered probit model, with the main variable of interest being the frequency of crime in a neighborhood, they found a negative association between crime and subjective well-being that was only significant for urban areas. This is evidence that there are geographical differences in the perception of crime, and further that it is a stronger predictor of subjective well-being in urban areas due to higher crime rates compared to rural areas.

Rural-urban migration is another area of interest for its impact on subjective well-being, particularly for developing countries. In the context of South Africa, migration is an interesting topic to understand given the restrictive racial development brought on by apartheid. Post-apartheid, mobility has increased both to urban areas and within them. Migration to an urban area can improve a household's situation in part through better

access to healthcare or childcare, as well as providing more job opportunities which allows for greater generation of wealth, income diversity, and avoidance of rural underemployment (Clarke and Eyal 2014). Using waves one and two of the NIDS, Clarke and Eyal (2014) look at the effect of government policies such as social welfare programs on rural-urban migration in South Africa as a way to understand what might drive a household to relocate. They find that government transfers are negatively associated with relocation; in particular they find that the child support grant, pensions, state housing assistance, and rural residency have a negative association with migration. People ages 18-30 were most likely to migrate, and households with younger children were more likely to migrate than households with school-age children. This is evidence that people partially base migration decisions on whether they are receiving support through the government, which provides insight on the effectiveness of government programs and suggests that people may be more likely to migrate if these welfare systems are lacking.

The previous articles describe some reasons why households may look to migrate, which is largely motivated by the belief that it will improve their quality of life or allow for better opportunities. Therefore, another important aspect of migration to explore is the impact it has on subjective well-being, to understand whether life satisfaction is actually improving the way people expect it to. Mulcahy and Kollamparambil (2016) use wave one and three of NIDS to observe the impact of migration on self-reported levels of life satisfaction in South Africa. Using multiple empirical models, they find a statistically significant negative impact of migration on well-being. Their preferred models show that rural-urban migration decreases subjective well-being by about 8.3% compared to non-migrants. From their results, the authors

speculate that this could be caused in part by high expectations of the urban lifestyle and through a loss of social capital from moving away from one's peer group and family. Rural-urban migrants not only have high expectations of what their income will be once they move, but also face a new relative comparison group of peers, which can also lead to dissatisfaction. The authors state how household size decreases when moving from a rural to urban location, and participation in religion also falls, which provides supplemental explanations for decreased well-being in the form of lost social capital.

The impact of relational factors on well-being is further validated by a paper by Salnikova (2019), which finds that more trust and mutual commitments contribute to higher subjective well-being in developing countries, particularly when institutional support is lacking. Similarly, Botha and Booysen (2014) utilize the 2011 South African Social Attitudes Survey to understand the association between family functioning and reported levels of happiness in South Africa. The authors found that improvements in family functioning, such as having good familial relationships, greater levels of attachment or closeness between members, and higher flexibility within the family are all positively associated with reported happiness when controlling for other characteristics. While these findings may be widely accepted or understood, these articles empirically support the notion that one's life satisfaction is largely influenced by social cohesion and the quality of their personal relationships.

Relativity and Expectations

The concept behind the hedonic treadmill explained earlier has not only been used to explain patterns of consumption but has also been suggested to explain the change in

expectations people experience as they adjust to other life improvements, such as increased access to services. Aklin et al. (2021) use longitudinal data in India to understand the impact of changes in access to electricity on life satisfaction. The authors found that while both supply and quality of electricity improved over a three-year period, expectations also evolved, and people became more sensitive to the quality of electricity provided. The authors suggest that while a service like electricity continues to see improvements in terms of duration or reliability, the impact on satisfaction may be lower or diminish as people begin to have greater expectations for that service. This is another example of how people adjust to their new situation and face evolving expectations that can impact the satisfaction they receive from subsequent improvements.

Comparisons to a relative peer or reference group have also been found to be highly influential in the way people feel about themselves and can impact the way people make decisions. Posel and Casale (2010) use the NIDS to look at how perceptions of relative ranking among peer groups, as well as within households, impact self-reported levels of happiness. They find that comparisons with oneself and with others influence life satisfaction; those who perceive themselves to be in the middle or richest third of the national income distribution reported higher levels of subjective well-being than the poorest third, but an individual's perceived ranking within their own village or suburb had a greater impact than at the national level. This suggests that geographic location impacts views on relative status - understandably so, as it is likely easier to make comparisons between oneself and one's neighbors than it is to compare to a household in another town. The authors also looked at mobility over time by utilizing a question that asked respondents to compare their current situation to when they were 15. For those who

ranked their present situation higher than when they were 15, they were more likely to be significantly happier with their life. Another important finding from this data was that race plays an important role in well-being - in particular, they found that Black South Africans reported much lower levels of subjective well-being than White South Africans, even after controlling for other factors of life satisfaction.

Bookwalter and Dalenberg (2009) take a similar approach to understanding the role of economic standing on income, but also discuss the various ways comparison can occur - within households, peer groups, geographically, or on an individual level, to name a few. Like Posel and Casale (2010), they find that subjective well-being varies by race, and further that relative standing had positive effects on well-being that were three-times the size of expenditure effects. Relative standing compared to one's parents had a major role in satisfaction levels, in that a household's likelihood of reporting dissatisfaction with their lives was greater if they were less well off than their parents. They also found that people on the higher end of the income distribution were more likely to be satisfied if they were doing better than their comparison peer group, while people on the lower end of the income distribution benefited from living among wealthier households in the form of spillovers and public goods in the community.

Capabilities

An alternative approach that has been proposed to understand different forms of poverty is to look through a lens of what a person is capable of. In his book *Development as Freedom*, Amartya Sen (1999) explains various ways of understanding poverty and economic disparities by asserting that poverty is not solely concerned with one's level of

income. He states that "... poverty must be seen as the deprivation of basic capabilities rather than merely as lowness of incomes." (Sen, 1999, p. 87) While low income can undeniably cause a person to be in poverty, in the context of capabilities, it is an instrumental factor and not the sole cause of poverty. Capability not only relates to what a person has access to, such as the capability to get to work (or the capability to *find* work for that matter), but also the capability to avoid undesirable outcomes, such as undernourishment or illiteracy (Sen 1999). When thinking of these issues, it is important to acknowledge the heterogeneity within and between communities, as the impact of low income may lead to a different experience for different individuals.

Sen (1983) also explains the differences between relative and absolute poverty. Relative poverty is concerned with how an individual or household compares to other people within that society - more specifically, by looking at whether they are deprived in the sense that they achieve less, or have less capabilities, than others. Absolute poverty ascertains that regardless of the situation of others, if there are people in that society experiencing starvation or homelessness for example, then poverty exists in that region.

To illustrate this, Sen (1983) explains a person's capabilities with the example of a bicycle: a bicycle can be a form of transportation, which provides the capability to move in a certain manner, and can result in utility to the individual in the form of increased mobility or enjoyment from the bike itself. However, this is reliant on the absolute ability to use the bike, in which case having a bike does not inherently improve your standard of living. He asserts that standard of living is not improved by any good in particular (such as a bike) but is rather improved by the ability to *use* that good. In other words, having ownership or availability of a good does not tell us what the person can do

with that good; standard of living assessments should not solely revolve around possession, but rather the usefulness of a resource for the individual. This distinction is important because it explains how a solution to one household might not be the solution for all households, which is important to remember when considering ways to improve the well-being of a society.

Intergenerational Mobility

Combining the themes of relative standing, expectations, and capabilities with more direct measures of economic progress such as educational attainment and income level results in another subset of literature called intergenerational mobility.

Intergenerational mobility focuses on comparisons of outcomes between family members and has more recently been included in subjective well-being research to understand how economic mobility impacts the way people feel about their lives. Nikolaev and Burns (2014) use data from the General Social Survey (GSS) from 1972 to 2012 to investigate the impact of upward and downward mobility on subjective well-being in the United States. They use three main measures of mobility: social, educational, and income.

Educational mobility is measured by comparing what level of school the respondent achieved to what their parents achieved (less than high school, high school, college degree, or graduate degree). Social mobility is constructed by using an occupational index, called socioeconomic index (SEI), which measures job desirability. The index ranks jobs by their reputation, which encompasses factors such as average earnings or education requirements. SEI Data is available for both the respondent and their parents, which the authors use to categorize quintiles that measure whether the respondent has upward or downward job, or social, mobility relative to their parents. Income mobility is

measured partially by questions about standard of living relative to parents, and through a variable that compares the approximate income of parents when the respondent was 16 years old, to an approximate income for the respondent at the time of the survey.

In a sense, intergenerational research provides an alternate view on what one generation was able to accomplish compared to another, particularly by looking at whether a person has achieved relatively more of something than their parents or grandparents. From a capabilities standpoint, it would be understandable to predict that improvements in educational attainment would increase one's capability to find work, whether that be because having a diploma might eliminate a hurdle in the job application process or achieving that higher level of education corresponded to gaining more connections that could result in potential job opportunities. Similarly, moving up a rung on the ladder may be synonymous with avoiding undesirable outcomes, which might show a capability to avoid poverty. The reverse may be true if downward mobility is more prevalent. Downward mobility could suggest that people are unable to change their situation, which would call for further research towards understanding why that is – what challenges are people facing if they are experiencing movements down a ladder rung, or if younger generations are achieving less schooling than their parents did.

Understanding the intersection of economic mobility and subjective well-being is the focus of this paper. The analysis that follows looks to understand how changes in educational and social mobility impact life satisfaction for people in South Africa. While there is an established subset of literature that analyzes subjective well-being in both developed and developing countries, understanding how economic mobility impacts well-being has been less explored in developing countries. This paper looks to fill that gap in

part by understanding the relationship between intergenerational mobility and well-being in South Africa and attempts to examine further whether the relationship differs by dividing the sample into two generation cohorts.

3. Data

The data used for this research are from the National Income Dynamics Study (NIDS), which was initially implemented by the South African Labour and Development Research Unit (SALDRU) in 2008. NIDS stemmed from an initiative of the Department of Planning, Monitoring and Evaluation (DPME) as a way for the government to observe and better understand changes in poverty over time. Since the inception of NIDS in 2008, approximately 28,000 individuals from 7,300 households across the country have been sampled, every two to three years, with the latest wave taking place in 2017 (Brophy et al. 2018). For the purposes of this study, waves three through five (2012, 2014-2015, and 2017, respectively) will be used.

To continually interview the same individuals or households, NIDS fieldworkers dedicate strong efforts to track and successfully complete subsequent surveys. These efforts include visiting a household at least three times over different parts of the day on at least two different days for households where no one is home, revisiting respondents who are temporarily away, as well as utilizing a detailed tracking system for people who move away from their previous location (Brophy et al. 2018). Those who refuse to participate in the survey are even contacted a second time as an attempt to keep them in the sample. These efforts make it possible to understand more about the livelihoods of many South Africans, which supports and makes it possible to do research projects such as this one. Taking time to track individuals for panel data can be laborious, but is

important for analysis; Walelign (2016) investigated the importance of tracking households for survey data and found that the extra work is worth the additional information that is provided.

NIDS provides detailed information about each household, ranging from questions about demographic and social characteristics to questions aimed at understanding topics like consumption and spending patterns, living standards, labor market participation, family structure, physical and emotional health, as well as asking individuals to report on their own well-being. The primary question used in this paper to analyze well-being asks, “Using a scale of 1 to 10 where 1 means “Very dissatisfied” and 10 means “Very satisfied”, how do you feel about your life as a whole right now?” There were 10,785 responses in my full sample that answered this question in Wave 3, 11,566 responses from Wave 4, and 11,891 responses from Wave 5. This measure of well-being will be the dependent variable for this research. **Figure 1** below shows the percentage of adults in each reported satisfaction level by wave for my full sample.

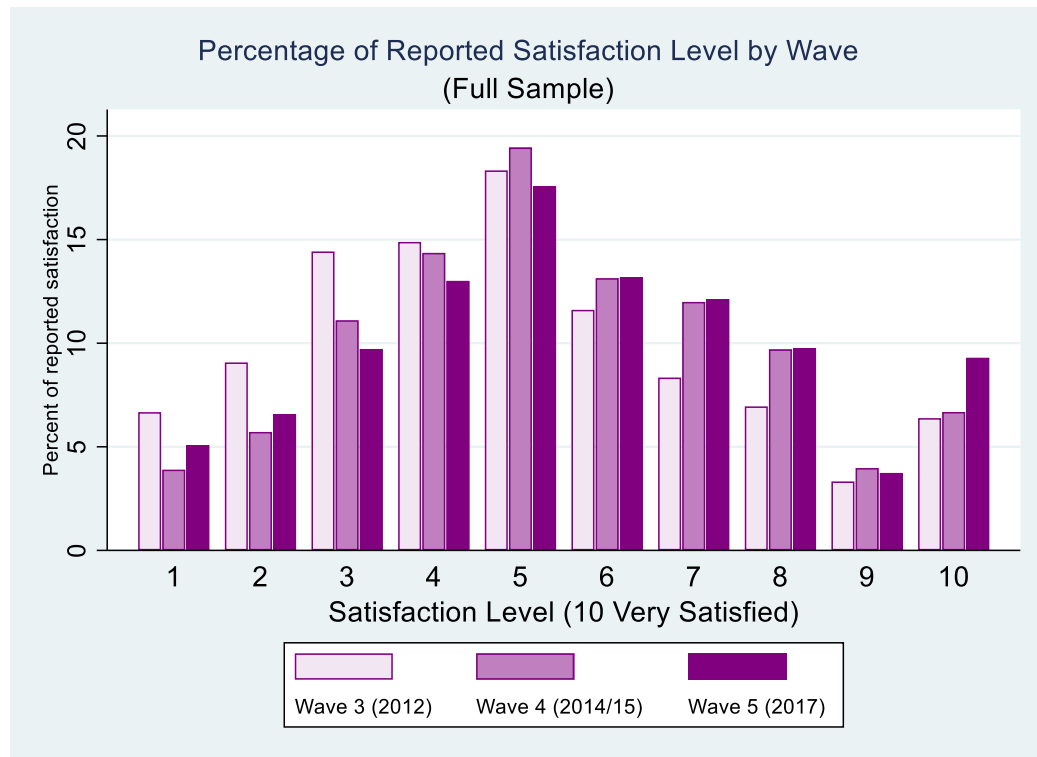


Fig. 1 Percentage of respondents at each level of satisfaction by wave for both cohorts of South Africans

The main respondent characteristics focused on in this study include health, marital status, educational status achieved, employment status, importance of religion, gender, and race. One note regarding the question about gender in the survey is that the options for the respondent to choose from are limited to male or female; respondents can refuse to respond, but there is no place to indicate another gender identity. Because this is not an inclusive list of gender identities, it is important to highlight that the choices listed are not sufficient and may have led some respondents to refuse to respond. There were 19 individuals in my initial data that refused to respond to the gender question but that did respond to the life satisfaction question. Because I dropped any observations that were missing or refused to answer from my sample, people that refused to answer the gender question are not included in my data.

Another important note is regarding race. In the questionnaire, there are options for African, Coloured, White, Asian or Indian, or other, for the question about which population group the respondent belongs to. NIDS also creates a “best” variable for key variables such as gender, race, age, education, mother and father, where they provide a best estimate for that variable from the information they receive across the waves. For this analysis, I utilized these “best” variables, so there are only four categories for race in my sample, which is also consistent with the South African Census (Census South Africa). While an alternative term would be used in another country to indicate a multi-racial person, Coloured is used in the context of South Africa to indicate a population group for people with a mixed racial background.

Other variables include housing characteristics such as what type of dwelling they live in and whether the household has electricity, along with income and expenditure variables. For dwelling type, a formal dwelling includes apartments or houses that are typically made of brick, a flat or apartment in a block of flats, town/cluster/semi-detached house (such as a simplex, duplex, or triplex), unit in retirement village, or a room or flatlet either in a backyard or not in a backyard. Informal dwelling types include caravans or tents, shacks either in or not in a backyard, or other informal dwelling structures. Traditional dwelling types include dwellings made with traditional materials such as mud or thatch.

Employment status is divided into three categories: currently employed, not economically active (not working or actively looking for a job), and unemployed, which includes both strictly unemployed people and discouraged workers. A discouraged worker is an unemployed person who is able to work, but not looking for a job for

reasons that might involve lack of hope around finding a job (Lloyd and Leibbrandt, 2014).

Following the Cantril Self-Anchoring Scale (Cantril, 1965), the first intergenerational mobility measure, social mobility, will be measured using questions that ask people to indicate where they feel they are on a ladder during the time of the survey, along with what rung of the ladder they believe their household was on when they were 15 years old. For the NIDS, respondents are asked to imagine a six-step ladder where the poorest people in South Africa stand on the bottom (the first step) and the richest people in South Africa stand on the highest step (the sixth step). This is followed by a set of questions which include, “On which step was your household when you were 15?” and “On which step are you today?” These questions provide insight on how individuals perceive their economic standing within their reference group and will be used to construct a measure of social mobility.

Following a similar approach as Nikolaev and Burns (2014), upward social mobility is defined as people who report being on a higher rung of the ladder than when they were 15, with downward mobility defined as a movement down the ladder. While this approach is not an exact indication of changes in the respondent’s income status, it provides information on how people perceive their economic situation, and if they perceive it to have improved or gotten worse from when they were 15. This second question is generally more indicative of the economic status of the respondent’s parents at that time, and therefore gives some insight towards intergenerational mobility.

The second mobility measure is education mobility. The NIDS asks questions about both the respondent’s highest school grade achieved, as well as the highest school

grade achieved by both their mother and father. Education mobility is constructed by taking the higher education level of the respondent's parents and using that to compare with the respondent's education level. From there, the variables are broken into three categories: higher, lower, or equal school completion. As with the social mobility measures, upward educational mobility is defined as the respondent having a higher reported level of education than the higher of their parents, while downward educational mobility includes people who report achieving less education than the higher of their parents.

The sample used in this paper is divided into two cohorts: apartheid and post-apartheid. This is done as an effort to understand and compare mobility for different generations. The generation cohorts are divided and defined based on the year the respondent was born: the first cohort (apartheid) includes respondents who were born in 1976 or earlier, and the second cohort (post-apartheid) is everyone born after 1976 but before 1990. This is so the youngest people included in this analysis are old enough to have been able to complete most of their education (set at approximately 22 years old), so that there is a fair analysis of educational mobility when comparing to the respondent's parents. The two cohorts are divided this way because it allows for comparisons across essentially two generations of South Africans; a group that lived the majority of their life under apartheid, and a group that was born close to the end of apartheid, therefore growing up mostly not under the apartheid regime. **Figure 2** below shows how educational attainment differs between the two cohorts.

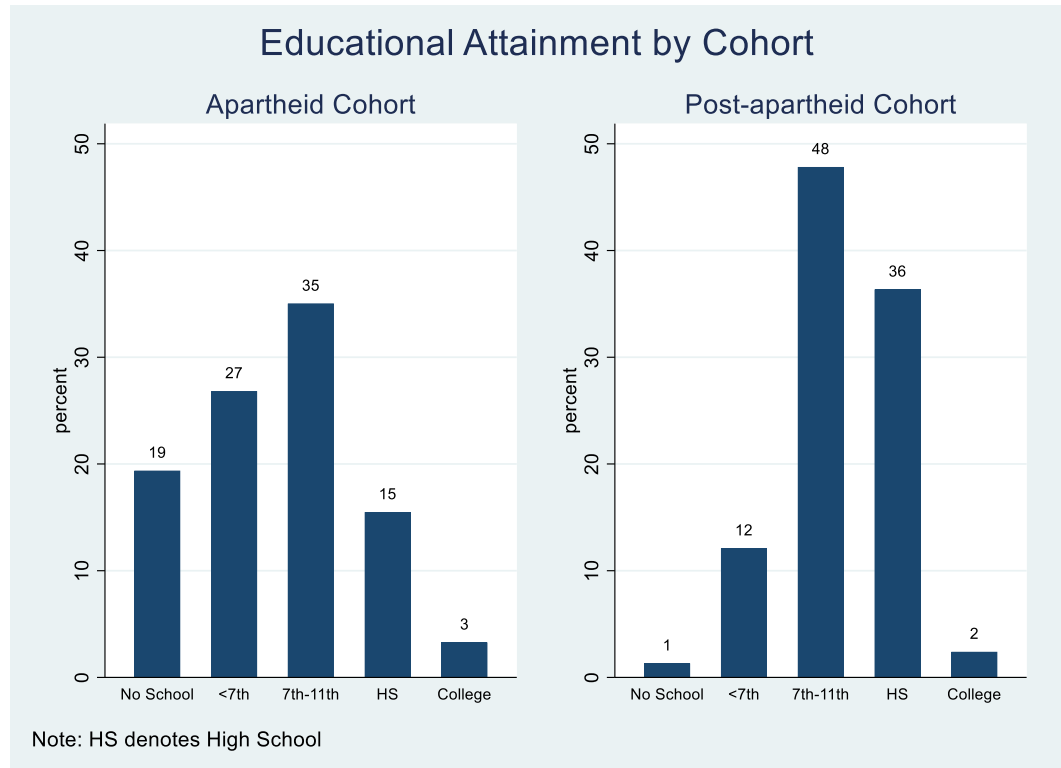


Figure 2. Respondent educational attainment by cohort

Looking at **Figure 2**, most evident might be the large decrease in the percentage of respondents who reported having no schooling. From this graph, it appears that many South Africans in the post-apartheid cohort experienced upward educational mobility. **Figure 3** below, which provides a visual of educational mobility for both cohorts, supports this and shows that many respondents in the apartheid cohort experienced upward educational mobility as well.

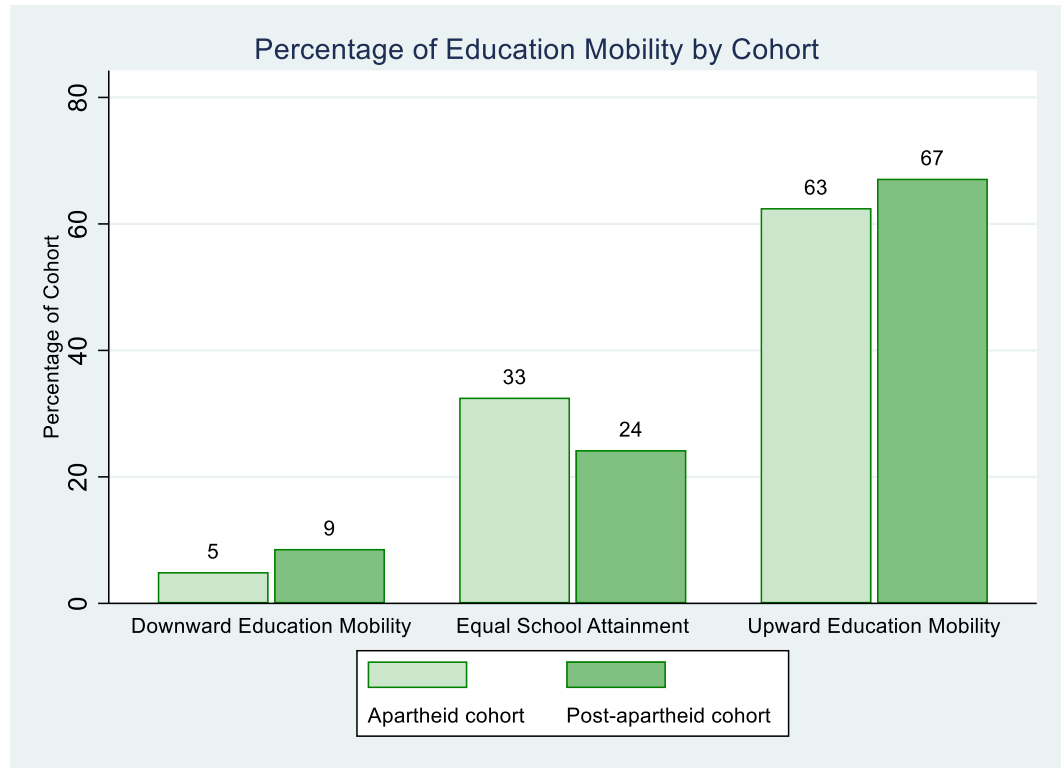


Figure 3. Education mobility, by percentage of each cohort

For my sample, only 2,157 respondents experienced downward education mobility, while 22,043 experienced upward educational mobility and 10,042 reported the same education attainment level. For social mobility, a large proportion of respondents experienced upward social mobility in both cohorts as well, as shown in **Figure 4** below.

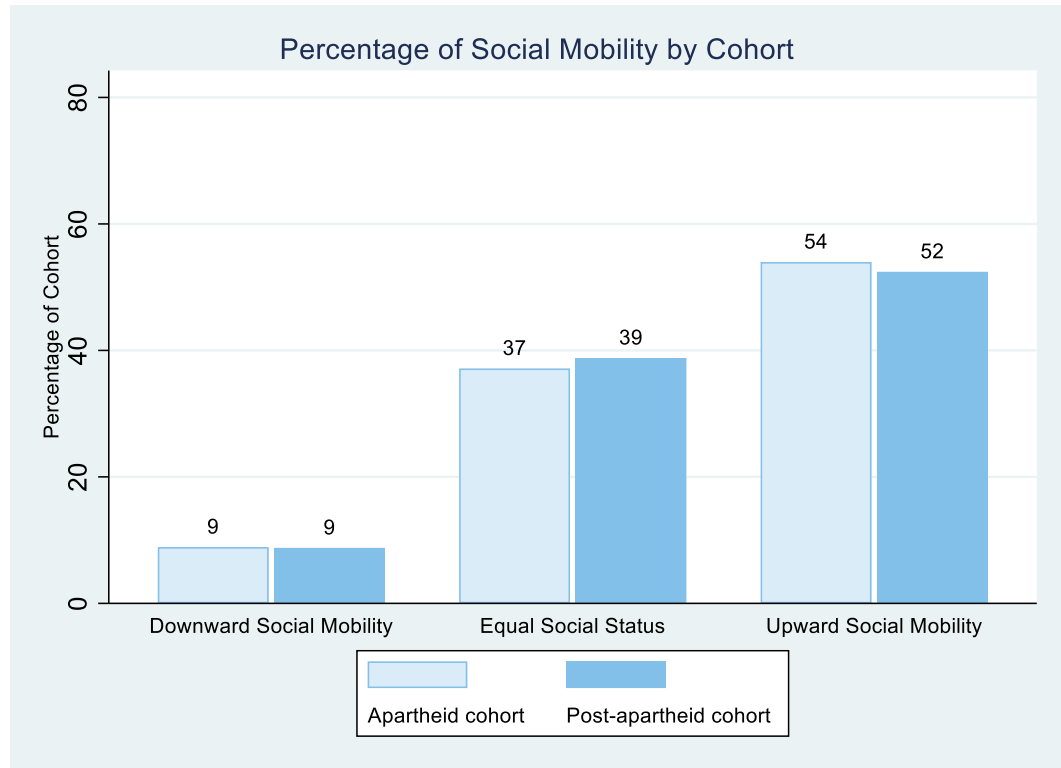


Figure 4. Social mobility, by percentage of each cohort

Looking at social mobility for the full sample, 18,341 respondents experienced upward social mobility, 3,146 downward, and 12,755 reported being on the same ladder rung as when they were 15.

Table 1 shows the descriptive statistics for each variable. **Table 1a**, included in the appendix, provides descriptive statistics by race.

Table 1. Descriptive Statistics for Key Variables

	Mean	Std. Dev.	Min.	Max.
<i>Well-Being and Mobility</i>				
Satisfaction Level (1 to 10)	5.33	2.41	1.00	10.00
Positive social mobility	0.54	0.50	0.00	1.00
Equal social status ^a	0.37	0.48	0.00	1.00
Negative social mobility	0.09	0.29	0.00	1.00
Education higher than parent	0.64	0.48	0.00	1.00
Education lower than parent	0.06	0.24	0.00	1.00

Education equal to parent ^a	0.29	0.46	0.00	1.00
Expenditure (in 1000 rand)	6.00	10.51	0.07	456.72
<i>Respondent Characteristics</i>				
Female	0.63	0.48	0.00	1.00
Best age - years	45.48	15.40	20.00	110.00
Never married ^a	0.38	0.49	0.00	1.00
Married and living together	0.46	0.50	0.00	1.00
Divorced or widowed	0.16	0.37	0.00	1.00
Poor health ^a	0.04	0.20	0.00	1.00
Fair health	0.12	0.32	0.00	1.00
Good health	0.31	0.46	0.00	1.00
Very good health	0.29	0.45	0.00	1.00
Excellent health	0.25	0.43	0.00	1.00
Religion is important	0.92	0.27	0.00	1.00
Religion is unimportant	0.08	0.27	0.00	1.00
<i>Race</i>				
White South Africans ^a	0.05	0.21	0.00	1.00
Black South African	0.82	0.39	0.00	1.00
Asian or Indian	0.01	0.12	0.00	1.00
Colored	0.12	0.33	0.00	1.00
<i>Education</i>				
No schooling ^a	0.13	0.33	0.00	1.00
School completion (less than 7 th)	0.21	0.41	0.00	1.00
School completion (7 th -11 th grade)	0.38	0.49	0.00	1.00
High school education	0.24	0.43	0.00	1.00
College - BA, MA, or Doctorate	0.03	0.18	0.00	1.00
<i>Employment Status</i>				
Employed	0.47	0.50	0.00	1.00
Not economically active	0.40	0.49	0.00	1.00
Unemployed - Strictly or Discouraged ^a	0.13	0.34	0.00	1.00
<i>Housing Characteristics</i>				
Formal dwelling	0.79	0.41	0.00	1.00
Informal dwelling or other	0.09	0.29	0.00	1.00
Traditional dwelling ^a	0.12	0.32	0.00	1.00
Electricity	0.86	0.35	0.00	1.00
Flush toilet	0.51	0.50	0.00	1.00
<i>Generation Cohorts</i>				
Generation 1 – Apartheid	0.62	0.48	0.00	1.00
Generation 2 – Post-Apartheid	0.38	0.48	0.00	1.00

<i>Year</i>				
Wave 3 – 2012 ^a	0.31	0.46	0.00	1.00
Wave 4 - 2015	0.34	0.47	0.00	1.00
Wave 5 - 2017	0.35	0.48	0.00	1.00
n	34242			

^a indicates base case for regressions.

Table 2 provides a table of means for the two cohorts. The means for the intergenerational mobility variables are similar between the two cohorts, however reported satisfaction is lower for the post-apartheid cohort compared to the apartheid cohort. Expenditure is lower in the post-apartheid cohort as well. Education level is higher for the post-apartheid cohort, and both employment and unemployment are higher in the post-apartheid cohort, with a smaller number of respondents reporting that they are not economically active compared to the apartheid cohort. The post-apartheid cohort has a smaller proportion of people that live in a formal dwelling and a higher proportion living in informal dwellings relative to the apartheid cohort, however the means for whether the household has electricity, or a flush toilet are approximately the same for the two cohorts.

Table 2. Table of Means by Cohort

	Apartheid	Post-Apartheid
Satisfaction Level (1 to 10)	5.36	5.27
Positive social mobility	0.54	0.53
Equal social status	0.37	0.38
Negative social mobility	0.09	0.09
Education higher than parent	0.63	0.67
Education equal to parent	0.32	0.24
Education lower than parent	0.05	0.09
Expenditure (in 1000 rand)	6.41	5.31
<i>Respondent Characteristics</i>		
Female	0.65	0.59
Best age - years	54.66	30.19
Never married	0.22	0.64

Married and living together	0.53	0.34
Divorced or widowed	0.25	0.02
Poor health	0.06	0.01
Fair health	0.16	0.04
Good health	0.35	0.25
Very good health	0.26	0.34
Excellent health	0.18	0.37
Religion is important	0.93	0.91
Religion is unimportant	0.07	0.09
<i>Race</i>		
White	0.06	0.02
African	0.79	0.86
Asian or Indian	0.01	0.01
Colored	0.13	0.11
<i>Education</i>		
No schooling	0.20	0.01
School completion (less than 7 th)	0.27	0.12
School completion (7 th -11 th grade)	0.34	0.46
High school education	0.16	0.38
College - BA, MA, or Doctorate	0.04	0.03
<i>Employment</i>		
Employed	0.43	0.54
Not economically active	0.50	0.24
Unemployed - Strictly or Discouraged	0.08	0.22
<i>Housing Characteristics</i>		
Formal dwelling	0.81	0.77
Informal dwelling or other	0.07	0.13
Traditional dwelling	0.13	0.10
Electricity	0.86	0.86
Flush Toilet	0.51	0.53
<i>Year</i>		
Wave 3 - 2012	0.33	0.29
Wave 4 - 2015	0.32	0.36
Wave 5 - 2017	0.35	0.35
n	21394	12848

Table 3 shows how the sample was made by explaining which observations were left out of the analysis. The sample size of 34,242 includes 21,394 observations for the apartheid cohort, and 12,848 observations in the post-apartheid cohort.

Table 3. Total Observations for Regressions

	Number of Observations
Total observations (Waves 3, 4, 5)	137,862
Didn't answer SWB question	72,732
	65,130
Not included in cohorts	18,545
	46,585
Missing for mobility measures	6,412
	40,173
Missing for other covariates	5,891
n	34,242

4. Empirical Strategy

This paper will utilize three main methods of regression analysis: cross-sectional, pooled cross-sectional, and panel data. Cross-sectional data is randomly sampled at a single point in time, whereas pooled cross-sectional analysis compares randomly sampled groups at different points in time, or across two time periods. Panel data observes the same households and makes comparisons over time by following up and asking the same survey questions (Wooldridge, 2020). Panel data is increasingly used in well-being research because it controls for some unobservable factors that do not change over time, such as unobservable individual characteristics. This has important implications when trying to understand questions about personal happiness and life satisfaction, because it is possible that these more challenging aspects to observe such as personality or predisposition towards life could be influencing the level of satisfaction a person reports, which may over or understate some of the estimates from the model.

However, there are still some hurdles to be cognizant of when using panel data. Das et al. (2009) highlight attrition and panel conditioning as two drawbacks to be aware

of with longitudinal data and develop approaches to handle these potential sources of bias. Attrition involves people dropping out of a data set, and often leads to bias if the cause of dropout is associated with a key variable. Panel conditioning can occur when there is a systematic difference in the way people respond to a survey in subsequent periods of data collection, compared to people who are first-time respondents. Goodman and Blum (1996) describe how panel attrition can ultimately dampen the generalizability of the analysis if certain groups are lost in the later periods of data collection, which essentially may erase the benefits of using a panel. Several robustness checks are performed to verify my estimates, including a regression that includes only those individuals who have observations in two consecutive waves.

The different regression methods are explored in this order: cross-sectional regressions for each wave of data that include the full sample of individuals in both cohorts, followed by pooled cross-sectional, fixed effects, and random effects models for the full sample of both cohorts, and lastly using the best model to run regressions for each cohort individually. To identify which model is better between fixed and random effects, Mundlak's (1978) test is utilized to identify fixed or random effects as more appropriate for the data by examining whether the time-invariant unobservable characteristics that do not change over time may be related to regressors in the model.

Empirical Model

The following equations are used to analyze determinants of well-being and intergenerational mobility:

Cross-section:

$$SWB_i = \beta_1 + \beta_2 \text{Mobility}_i + \beta_3 \text{Education}_i + \beta_4 \text{Employment}_i + \beta_5 \text{Expenditure}_i + \beta_6 \text{Characteristics}_i + \beta_7 \text{Race}_i + \beta_8 \text{Gender}_i + \beta_9 \text{Housing}_i + e_i$$

Pooled Cross-Section:

$$SWB_{it} = \beta_1 + \beta_2 \text{Mobility}_{it} + \beta_3 \text{Education}_{it} + \beta_4 \text{Employment}_{it} + \beta_5 \text{Expenditure}_{it} + \beta_6 \text{Characteristics}_{it} + \beta_7 \text{Race}_{it} + \beta_8 \text{Gender}_{it} + \beta_9 \text{Housing}_{it} + e_{it}$$

Panel:

$$SWB_{it} = \beta_1 + \beta_2 \text{Mobility}_{it} + \beta_3 \text{Education}_{it} + \beta_4 \text{Employment}_{it} + \beta_5 \text{Expenditure}_{it} + \beta_6 \text{Characteristics}_{it} + \beta_7 \text{Housing}_{it} + \delta_i + e_{it}$$

where SWB is the respondent's reported level of satisfaction for individual i in time period t , with e_{it} as the random error term and δ_i represents the unobservable characteristics that do not change over time for that respondent in the panel model. The goal for this was to explore two main things: whether there are any differences in the salience of the determinants of subjective well-being for each cohort, and to see how intergenerational mobility impacts well-being for South Africans as well as if it's different based on cohort.

Except for reported satisfaction and expenditure (in 1000 rand), the variables for this equation are in the form of dummy variables that take on a value of one if true and zero if false for the respondent. Education is a measure of the respondent's highest school level accomplished, broken down into five categories: no school, some school which indicates that the respondent has accomplished some level of schooling below 7th grade, respondents who accomplished a level of schooling between 7th and 11th grade,

respondents who have a high school diploma, and respondents who have attended some level of higher education (includes Bachelors, Masters, and Doctorate). Employment is split into three main categories: strictly unemployed or discouraged worker, employed, or not economically active. Unemployed and no schooling are the base case for those two variables. The housing dummies provide information on what type of dwelling the household lives in, and whether they have electricity or a flush toilet. Expenditure is an imputed monthly amount, which is used as a measure of the household's wealth and is reported in 1000 rand. Respondent characteristics include gender, race, importance of religion, health, and marital status, which help to understand more about the individual. The base case for those variables is a White South African male who reported never being married, living in a traditional dwelling, reporting religion as unimportant, and with poor health.

The first goal of this research is to observe the determinants of subjective well-being for both cohorts of South Africans, with a particular focus on the impact of intergenerational mobility on life satisfaction. By utilizing three methods of regression analysis, this research also expands on the literature that compares different empirical strategies, particularly in the context of understanding subjective well-being in developing countries.

5. Results

Cross-Sectional Results:

Table 4 below provides the results from the cross-sectional regressions which includes the full sample of observations (both cohorts) in each wave. All estimation was

done using Stata version 17.0. These results show the effect each variable has on subjective well-being, holding all other variables constant. For the intergenerational mobility measures, the coefficient on the positive social mobility measure is statistically significant in all three waves, and the coefficient is large relative to other intergenerational mobility coefficients. Negative social mobility has a negative coefficient, but is relatively small and statistically insignificant. The education mobility measure shows interesting results; for the negative education mobility variable (people with less education than their parents), the sign is positive although very small and insignificant, while the positive education mobility variable is negative and significant in each wave (at the 5% level in wave 3, and at the 0.1% level for waves 4 and 5).

Table 4. Cross Sectional Regressions, NIDS (2012-2017)

	Wave 3	Wave 4	Wave 5
<i>Mobility and Expenditure</i>			
Positive social mobility	0.391*** (0.03)	0.399*** (0.04)	0.456*** (0.04)
Negative social mobility	-0.016 (0.06)	-0.062 (0.06)	0.011 (0.06)
Education higher than parent	-0.107* (0.04)	-0.141*** (0.04)	-0.160*** (0.04)
Education lower than parent	0.071 (0.08)	0.097 (0.07)	0.119 (0.07)
Expenditure (in 1000 rand)	0.023*** (0.00)	0.020*** (0.00)	0.014*** (0.00)
Covariates			
Respondent Characteristics	Y	Y	Y
Education	Y	Y	Y
Employment	Y	Y	Y
Housing Characteristics	Y	Y	Y
Respondent Health	Y	Y	Y
n	19,944	19,737	20,257
R-squared	0.1118	0.0977	0.1025

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

The full table of cross-sectional results can be found in **Table 2a** in the appendix. For comparisons by population group, relative to White South Africans, the coefficient for Black South Africans is negative and statistically significant in all three waves. The Asian or Indian population group has a negative coefficient in each wave, but is smaller and insignificant. The coefficient for the Coloured population group is negative in the third wave and positive in the fourth and fifth, but not significant in any of the three.

The coefficient on education increases with additional years of schooling in all three waves, with some level of college having the largest positive impact on well-being. Both formal and informal dwelling types (compared to traditional dwellings) have positive coefficients, with formal dwellings having a significant effect in each of the three waves. Having access to electricity and a flush toilet in the dwelling also positively impacts well-being.

Relative to being unemployed, employment is predicted to significantly increase well-being in all three waves, while not being economically active has a small insignificant positive effect. Health follows a similar pattern as education, with improvements in health positively impacting well-being. Waves three and five are relatively similar in their coefficients on health while the wave four coefficients are much lower and not significant at any level of health. A respondent reporting that religion is an important component of their life also positively and significantly impacts well-being.

Pooled Cross Section, Fixed and Random Effects Regressions:

Table 5 shows the results from the pooled cross-sectional method in the first column, followed by the fixed effects and random effects methods in columns two and

three, respectively. For the fixed effects model, variables such as race and gender drop out because in the data they do not change over time. Overall, the pooled cross section and random effects models behave similarly, but the fixed effects model differs in many instances. The intergenerational mobility coefficients are fairly similar to the cross-sectional models, and are close in magnitude between these three methods as well. Positive education mobility is significant in the pooled and random effects models, but not in the fixed effects model, and all three are negative.

Table 5. Pooled Cross Section and Panel Regressions, NIDS (2012-2017)

	Pooled CS	Fixed Effects	Random Effects
<i>Mobility and Expenditure</i>			
Positive social mobility	0.458*** (0.03)	0.404*** (0.04)	0.457*** (0.03)
Negative social mobility	-0.025 (0.05)	0.028 (0.07)	-0.023 (0.05)
Education higher than parent	-0.102** (0.03)	-0.080 (0.08)	-0.103** (0.03)
Education lower than parent	0.119* (0.06)	0.091 (0.12)	0.119* (0.06)
Expenditure (in 1000 rand)	0.016*** (0.00)	0.011*** (0.00)	0.016*** (0.00)
Covariates			
Respondent Characteristics	Y	Y ^a	Y
Education	Y	Y	Y
Employment	Y	Y	Y
Housing Characteristics	Y	Y	Y
Respondent Health	Y	Y	Y
Wave Dummies	Y	Y	Y
n	34,242	34,242	34,242
R-squared	0.1170	0.0805 ^b	0.1170 ^b

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

Note: Robust standard errors clustered on person id are reported in parenthesis.

^a With fixed effects, race and gender are constant over time in the data and therefore drop out of the model.

^b R-squared reported for fixed effects is the overall r-squared

Just like in the cross sections, electricity, having a flush toilet, and living in a formal dwelling all significantly and positively impact well-being, with the exception of formal dwelling being insignificant in the fixed effects model. Improvements in health for the most part positively impact well-being in each model, but the coefficient is smaller in the fixed effects model at almost each level. The coefficients on the education terms are almost identical in the pooled and random effects models, but are all negative and insignificant in the fixed effects model, which raises some questions. I would have expected that increasing education from no school to some level of schooling would improve well-being, but that's not the case in this regression. However, none of the negative coefficients are significant, so perhaps a different sample would provide more clarity on the impact of education in panel models. Full results can be found in **Table 3a** in the appendix.

Generation Cohort Regressions using Fixed Effects:

For the regressions by cohort, I used information from the results above, compared the theory behind each of the methods, and ultimately performed Mundlak's (1978) test to evaluate which panel method would be best for analysis of well-being with this data. NIDS provides a unique opportunity to use panel data for a developing country, which is typically preferred for analysis over other methods because of the ability to control for unobservable personal characteristics that do not change over time. Cross-sectional data provides useful results for understanding well-being and allows for the inclusion of factors such as gender and race, but utilizing the panel is especially helpful

when doing an analysis about reported well-being, as it more accurately ensures the effects of the regressor variables by controlling for unobserved heterogeneity.

Focusing on the panel approach, the next step was to decide whether fixed or random effects would be best for this data. Random effects models are more efficient if the regressors, or independent variables, are uncorrelated with individual effects, whereas the fixed effect method assumes that the regressors are correlated with omitted variables, which include characteristics of each individual. One hesitation with making comparisons between individuals is that there are likely some intrinsic differences that would influence the way each person responds to questions about their life satisfaction. Fixed effects models separate the unobserved effect from the time-varying error for each observation and allows that unobserved error to be correlated with the regressors (Wooldridge 2020).

To test whether a fixed or random effects model is more appropriate, Mundlak (1978) formulated a test that can be used when using clustered standard errors, as is the case with this data. After running the test with my regressions, the results provide convincing evidence to reject the hypothesis that all the coefficients are jointly zero (Chi-squared = 73.71, $p = 0.000$); meaning the regressors and time-invariant characteristics are correlated. This indicates that a fixed effects model is preferred over random effects, because as mentioned above, random effects should be used when there is no correlation between the individual effects and the regressors. Pairing this with theoretical knowledge of the different methodologies discussed previously, I concluded that utilizing a fixed effects model for the comparison of generation cohorts would produce estimates that were statistically consistent and ran the final regressions that restricted the sample to each generation individually.

This leads into the focus of this paper: **Table 6** reports the results from the fixed effects regressions on each generation cohort. Just like in the table above, race and gender are constant over time in the data and therefore drop out of the model. Column one includes only the sample of people from the generation one cohort (n = 21,394), and column two includes only the sample of people from the generation two cohort (n = 12,848). Running a regression for each generation cohort individually allows for comparisons of the determinants of subjective well-being by sign and salience between the two cohorts.

For the two measures of interest regarding mobility, only positive intergenerational mobility was found to have a strong positive impact on well-being for both cohorts. The education mobility variable was insignificant for respondents who reported having either a higher or lower education than their parents, relative to having the same level of schooling as their parents. The coefficient on the higher relative education variable was negative for both generation cohorts, however it was statistically insignificant in these models. The full table of results can be found in **Table 4a** in the appendix.

Table 6. Fixed Effects Regressions by Generation Cohorts, NIDS (2012-2017)

	Apartheid	Post-apartheid
<i>Mobility and Expenditure</i>		
Positive social mobility	0.496*** (0.05)	0.246*** (0.07)
Negative social mobility	0.084 (0.08)	-0.068 (0.11)
Education higher than parent	-0.111 (0.12)	-0.054 (0.12)
Education lower than parent	0.245 (0.17)	-0.042 (0.17)
Expenditure (in 1000 rand)	0.009*	0.015**

	(0.00)	(0.01)
Covariates		
Respondent Characteristics	Y ^a	Y ^a
Education	Y	Y
Employment	Y	Y
Housing Characteristics	Y	Y
Respondent Health	Y	Y
Wave Dummies	Y	Y
n	21,394	12,848
R-squared	0.0946 ^b	0.0640 ^b

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

Note: Robust standard errors clustered on person id are reported in parenthesis.

^a With fixed effects, race and gender are constant over time in the data and therefore drop out of the model.

^b R-squared reported for fixed effects is the overall r-squared

To test whether there were differences between the cohorts, I performed a Chow test in Stata. The Chow test examines whether the coefficients between the two cohorts are statistically different (Wooldridge, 2020). Rejecting this test would mean that the two cohorts are not the same; the coefficients are statistically different between the two generations. With my data, there was convincing evidence to reject the hypothesis ($F = 5.46$, $p = 0.000$) that the difference between cohorts is zero, and therefore conclude that there are differences between the two generations.

Testing each variable individually, I saw that these differences were primarily driven by three variables in my regression: the coefficients for fair health, positive social mobility, and wave 5 are statistically different from zero. Looking at the interaction regression results included in **Table 9a** in the appendix, this means that reporting fair health meant higher satisfaction for the younger post-apartheid cohort than the older apartheid cohort, and satisfaction in wave 5 was higher for the younger cohort than the older cohort. For positive social mobility, the effect of moving up the ladder was less significant for the post-apartheid cohort than the apartheid cohort. This confirms that the difference in the coefficients for positive social mobility between the two cohorts in

Table 6 is statistically different for these two cohorts. For the other covariates in the regression, the difference in coefficients between the two groups was not statistically different from zero, which means that for the other determinants of well-being (such as education, marital status, religion, employment, etc.), the two groups are impacted in similar ways by these variables. This suggests that both cohorts experience similar levels of utility (or disutility) from these established determinants of well-being.

Robustness Checks

For my sample, I considered four main factors that might have changed my estimates and ran separate regressions that served as robustness checks to see whether each factor influenced my results. The first was to run fixed effects regressions by cohort just for the sample of Africans in my analysis, followed by excluding expenditure outliers by dropping the top 1% of respondents for the expenditure measure. Next, I ran a regression that removed the top-up observations from the sample. Top-up observations are respondents who were included in the fifth wave (2017) to increase the number of White South African and Asian or Indian respondents and capture a greater number of wealthier individuals in the survey (Brophy et al. 2018). Looking at **Table 2.9** in the appendix, which shows the breakdown of attrition by race, we can see that White South Africans, Asian or Indian respondents had the highest attrition rates. The last test was to see whether attrition changed my results.

Table 7 below shows the results for a sample that only includes Africans, along with a sample that excludes expenditure outliers. For both factors, the main mobility variables did not change drastically, which suggests that keeping all races and

expenditure outliers in my main regressions did not alter the estimates. The full results for these two robustness tests can be found in **Table 5a** and **Table 6a** in the appendix.

Table 7. Robustness Check – African only sample and no outliers

	African only		No expenditure outliers	
	Apartheid	Post-apartheid	Apartheid	Post-apartheid
<i>Mobility and Expenditure</i>				
Positive social mobility	0.498*** (0.05)	0.263*** (0.07)	0.496*** (0.05)	0.245*** (0.07)
Negative social mobility	0.104 (0.09)	-0.076 (0.12)	0.084 (0.08)	-0.060 (0.11)
Education higher than parent	-0.153 (0.14)	-0.091 (0.13)	-0.111 (0.12)	-0.055 (0.12)
Education lower than parent	0.391* (0.20)	-0.052 (0.18)	0.245 (0.17)	-0.034 (0.17)
Expenditure (in 1000 rand)	0.012 (0.01)	0.021** (0.01)	0.009* (0.00)	0.021** (0.01)
Covariates				
Respondent Characteristics	Y ^a	Y ^a	Y ^a	Y ^a
Education	Y	Y	Y	Y
Employment	Y	Y	Y	Y
Housing Characteristics	Y	Y	Y	Y
Respondent Health	Y	Y	Y	Y
Wave Dummies	Y	Y	Y	Y
n	16,957	11,053	21,393	12,847
R-squared	0.046	0.050	0.036	0.043

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

Note: Robust standard errors clustered on person id are reported in parenthesis.

^a With fixed effects, race and gender are constant over time in the data and therefore drop out of the model.

R-squared reported for fixed effects is the overall r-squared

Table 8 shows regression results for a sample that excludes top-up observations.

There are a total of 909 top-up observations in my sample. Estimates and standard errors from this regression are also very similar to my main results. Full results can be found in **Table 7a** in the appendix.

Table 8. Robustness Check – No top-ups

	No top-up sample
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	Apartheid	Post-apartheid
<i>Mobility and Expenditure</i>		
Positive social mobility	0.496*** (0.05)	0.246*** (0.07)
Negative social mobility	0.084 (0.08)	-0.068 (0.11)
Education higher than parent	-0.111 (0.12)	-0.054 (0.12)
Education lower than parent	0.245 (0.17)	-0.042 (0.17)
Expenditure (in 1000 rand)	0.009* (0.00)	0.015** (0.01)
Covariates		
Respondent Characteristics	Y ^a	Y ^a
Education	Y	Y
Employment	Y	Y
Housing Characteristics	Y	Y
Respondent Health	Y	Y
Wave Dummies	Y	Y
n	20,718	12,615
R-squared	0.036 ^b	0.042 ^b

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

Note: Robust standard errors clustered on person id are reported in parenthesis.

^a With fixed effects, race and gender are constant over time in the data and therefore drop out of the model.

^b R-squared reported for fixed effects is the overall r-squared

Lastly, I tested for attrition. NIDS calculates attrition rates by looking at the number of successful interviews in one wave compared to the previous wave, to find that most recent wave's attrition rate (Brophy et al. 2018). Reasons for attrition include refusal to participate, non-contact (people who were not tracked, located, or moved outside of South Africa), or the respondent died between waves. To test for attrition, I removed all observations that did not appear in the next wave from the regression to see the impact of the people who dropped out of the survey on the results. I did this by creating a variable that indicates whether respondents in wave 3 were also in wave 4, and if respondents in wave 4 were in wave 5. I used this variable, which indicates whether the respondent was in the next wave, to run regressions by cohort. The sample dropped from

34,242 observations to 22,351 when testing for attrition; for 11,891 observations there were gaps between observations, or the respondent dropped out of the data for one of the reasons listed above. For the apartheid cohort, 7,409 observations were lost for a sample size of 13,985 observations, and for the post-apartheid cohort, 4,482 observations were lost for a total sample size of 8,366 when testing for attrition. **Table 9** below shows the results for this attrition test. **Table 8a** in the appendix shows the full results when testing for attrition.

Table 9. Test for Attrition

	Apartheid	Post-apartheid
<i>Mobility and Expenditure</i>		
Positive social mobility	0.453 ^{***} (0.07)	0.238 [*] (0.10)
Negative social mobility	0.083 (0.13)	0.069 (0.18)
Education higher than parent	-0.024 (0.17)	0.000 (0.18)
Education lower than parent	0.068 (0.24)	-0.283 (0.28)
Expenditure (in 1000 rand)	0.017 ^{**} (0.01)	0.015 (0.01)
Covariates		
Respondent Characteristics	Y	Y
Education	Y	Y
Employment	Y	Y
Housing Characteristics	Y	Y
Respondent Health	Y	Y
Wave Dummies	Y	Y
n	13,985	8,366
R-squared	0.048 ^b	0.057 ^b

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

Note: Robust standard errors clustered on person id are reported in parenthesis. With fixed effects, race and gender are constant over time in the data and therefore drop out of the model.

^b R-squared reported for fixed effects is the overall r-squared

Comparing the results from the robustness checks to the primary results listed in **Table 6**, there are only small differences in the coefficients for the mobility measures.

The main difference from my primary results was for positive social mobility in the post-apartheid cohort when testing for attrition: the coefficient drops from 0.246 to 0.238, which changed the statistical significance of the coefficient from the 0.001 level to the 0.05 level. The sign remains the same when testing for attrition, however. This suggests that when considering these factors, the primary results are robust: top-up observations, expenditure outliers, attrition, and limiting the sample to only Africans did not noticeably impact my results.

6. Discussion

Findings

Once I identified the fixed effects model as the best model, I ran fixed effects regressions for each generation cohort individually to be able to compare the coefficients for the two groups. The determinants of well-being included in this analysis have a consistent impact for both cohorts; intergenerational mobility is an exception in that the positive impact on well-being of moving up a ladder rung for the apartheid cohort is much greater than for the post-apartheid cohort, although the sign on the coefficient is in the same direction. In their review of literature on income and happiness, Diener and Biswas-Diener (2001) found themes that income improved happiness when it meant avoiding poverty and meeting basic needs, but the effect diminished at higher levels of income. This could partially explain the differences in coefficients between the cohorts in my analysis; for the older generation, climbing up the ladder may have meant these households were moving out of poverty and were able to enjoy better living standards, while for the younger generation, movements further up the ladder might not have the

same impact. Additionally, Bookwalter and Dalenberg (2009) found that doing better in terms of economic standing relative to one's parents positively and significantly impacts well-being. The nature of my social mobility variable is perception-based in that it compares each respondent's own assessment of their current economic situation to when they were 15, which is more indicative of their parents economic standing. Therefore, the strong positive coefficients for social mobility for both cohorts in my analysis supports this finding from Bookwalter and Dalenberg (2009).

Education mobility was not statistically significant for either generation cohort in the final models. This is interesting when looking at the mean tables for each generation, which shows both generations experiencing sizable upward educational mobility. Comparing each education level across generations, the proportion of respondents in the sample who reported having no schooling went from 0.20 in the apartheid cohort to only 0.01 of respondents in the post-apartheid cohort. This would suggest that while educational attainment has improved in terms of school grade completion, the impact that this improvement has on subjective well-being is not clear. This is interesting when paired with the strong positive impact that social mobility has on well-being, which suggests upward mobility does have an impact on well-being, while upward mobility in the context of education does not.

However, in the cross-sectional regressions, positive education mobility positively and statistically significantly impacted reported well-being, and looking at each level of education individually, we can see that improvements in education level positively impact well-being as well. The variance in results across the different models could potentially be because the sample of respondents used for this analysis includes adults

ages 22 and older, which for many people means they are likely to have completed all the levels of education they will achieve in their life, aside from adults who return for more schooling. One condition for using a fixed effects model is that there must be some variation in the regressors or independent variables over time for the individual (Wooldridge 2020). These education variables therefore might be essentially behaving as fixed variables if they do not change from one wave to the next, so the lack of variation could be causing the unusual results and large standard errors.

7. Conclusion

The purpose of this research was to explore the relationship between intergenerational mobility and subjective well-being in South Africa by comparing two generation cohorts of South Africans. When utilizing a fixed effects regression analysis method, education mobility, measured by whether the respondent achieved a higher level of education than their parents, did not have a statistically significant impact on subjective well-being for either cohort. One possible explanation for this is that with higher education often comes higher expectations to be successful, or provide for the family, which could have a dampening effect on well-being (Mangoma and Wilson-Prangle, 2019; Jones, 2019). Social mobility, measured by comparing the economic status of respondents at the point in time of the survey versus their family's economic status when they were 15, did have a significant positive impact on well-being for both generation cohorts, however the effect was smaller for the younger generation. This could be due to rising expectations as people climb the ladder, or could signal that the first generation (with an average age of 55 years) faced initial development changes such as gaining access to piped water or electricity, or moving from a traditional to formal

dwelling, which could correlate with movements up the economic ladder. With the average age of the younger generation being 30 years, this may suggest that most people had access to those public goods or services most if not all of their lives, and therefore it would take a greater income level or greater marginal improvements in order to have a similar impact on well-being, or may also be evidence of evolving expectations or diminishing returns to additional levels of income. This is something that needs to be researched further in order to understand why the impact of moving up the ladder is lower for the younger cohort of South Africans.

This research adds to the growing body of literature that sets out to understand subjective well-being, with a particular focus on understanding the concept within a developing country. The National Income Dynamics Study conducted in South Africa provides the ability to analyze panel data for a developing country, which allows for a more robust analysis of subjective well-being for individuals. The mobility measures used for this research are a good starting point for analyzing mobility with NIDS data, but it is important to note some of the limitations with the approach taken in this analysis.

The social mobility measure was constructed using a question that asks people how they perceive their economic standing, which can be a useful way to see how perceptions of economic status impact well-being, but constructing a variable that looks at income levels for each household relative to other households in South Africa would capture a more accurate measure of income mobility. Using the education variable in panel regressions may pose a challenge if the level of education is unchanged for many respondents, because it may essentially work as another fixed effect. The positive and statistically significant results in the cross sections suggest that education mobility does

impact well-being, however the cross-sectional model was found to be inferior when panel methods can be utilized. Analyzing the impact of education mobility on well-being with another method of regression might show different results and would be interesting to study further.

Separating the sample into two cohorts based on birth year also leads to some discrepancies in measurement; for example, for the apartheid cohort, the average age is 55 years, whereas the average age of the post-apartheid cohort is 30 years. The time between the respondent's current assessment of their household standing on a ladder and when they were 15 will vary quite a bit between the two groups, which may also influence the way people respond to these questions.

It is also important to note that geographic location may influence responses to well-being. In this paper, I did not include a variable that controls for the geographic location of respondents. Other controls, such as family size, neighborhood characteristics, or more detailed employment information, could have been added as well to reduce omitted variable bias within my analysis.

With fixed effects regressions, the benefits of longitudinal household survey data can be maximized. However, Nikolaev and Burns (2014) utilized an ordered logit model because of the categorical nature of the dependent variable (reported subjective well-being). Comparing my results regarding intergenerational mobility from the fixed effects regressions to an ordered regression model would be interesting next step for further research, as ordinal models are commonly used in analysis of subjective well-being (Bookwalter and Dalenberg 2004; Bookwalter and Dalenberg 2009; Posel and Casale (2010); Ebrahim et al. 2013).

The purpose of this analysis was to explore the relationship between intergenerational mobility and subjective well-being by utilizing the longitudinal nature of NIDS for regressions. Further research aimed at understanding what is driving these movements in intergenerational mobility would provide useful information on economic mobility in post-apartheid South Africa. Studying this within the context of subjective well-being will maintain a focus on whether subsequent movements continue to improve or impact life satisfaction.

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Appendix

Table 1a. Means by Race

	African	Colored	White	Asian or Indian
Satisfaction Level (1 to 10)	5.06	6.37	7.01	6.41
Positive social mobility	0.53	0.60	0.51	0.51
Equal social status	0.38	0.32	0.35	0.39
Negative social mobility	0.09	0.08	0.14	0.10
Education higher than parents	0.66	0.60	0.41	0.65
Education lower than parent	0.05	0.09	0.17	0.11
Education equal to parent	0.28	0.31	0.43	0.24
Expenditure (in 1000 rand)	4.50	6.52	27.71	15.73
Female	0.63	0.60	0.56	0.61
Best age - years	44.94	45.69	53.70	47.31
Never married	0.42	0.27	0.08	0.11
Married and living together	0.42	0.59	0.72	0.72
Divorced or widowed	0.16	0.14	0.20	0.17
Poor health	0.04	0.05	0.02	0.04
Fair health	0.12	0.12	0.09	0.09
Good health	0.30	0.32	0.33	0.29
Very good health	0.29	0.29	0.30	0.35
Excellent health	0.25	0.22	0.26	0.23
Religion is important	0.92	0.95	0.88	0.93
Religion is unimportant	0.08	0.05	0.12	0.07
No schooling	0.14	0.08	0.00	0.03
School completion (less than 7 th)	0.21	0.25	0.09	0.14
School completion (7 th - 11 th)	0.39	0.45	0.17	0.36
High school education	0.23	0.20	0.52	0.38
College - BA, MA or Doctorate	0.03	0.02	0.22	0.09
Employed	0.45	0.55	0.59	0.46
Not economically active	0.41	0.35	0.37	0.48
Unemployed - Strictly or Discouraged	0.14	0.10	0.04	0.06
Formal dwelling	0.76	0.89	0.98	0.95
Informal dwelling or other	0.10	0.09	0.01	0.03
Traditional dwelling	0.14	0.02	0.01	0.02
Electricity	0.84	0.92	0.95	0.94
Flush toilet	0.42	0.91	1.00	0.99
Cohort 1 - Apartheid	0.61	0.67	0.84	0.68
Cohort 2 – Post-apartheid	0.39	0.33	0.16	0.32
Wave 3 - 2012	0.32	0.31	0.25	0.28
Wave 4 - 2015	0.35	0.35	0.22	0.22
Wave 5 - 2017	0.33	0.35	0.54	0.51

n	28010	4139	1627	466
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Table 2a. Cross Sectional Regressions (complete), NIDS (2012-2017)

	Wave 3	Wave 4	Wave 5
<i>Mobility and Expenditure</i>			
Positive intergenerational mobility	0.391*** (0.03)	0.399*** (0.04)	0.456*** (0.04)
Negative intergenerational mobility	-0.016 (0.06)	-0.062 (0.06)	0.011 (0.06)
Education higher than parent	-0.107* (0.04)	-0.141*** (0.04)	-0.160*** (0.04)
Education lower than parent	0.071 (0.08)	0.097 (0.07)	0.119 (0.07)
Expenditure in 1000R	0.023*** (0.00)	0.020*** (0.00)	0.014*** (0.00)
<i>Respondent Characteristics</i>			
Female	0.024 (0.03)	0.083* (0.03)	0.077* (0.03)
Best age - years	-0.033*** (0.01)	-0.009 (0.01)	0.003 (0.01)
African	-1.236*** (0.10)	-0.811*** (0.11)	-0.753*** (0.09)
Asian or Indian	-0.133 (0.17)	-0.120 (0.17)	-0.256 (0.14)
Coloured	-0.151 (0.11)	0.162 (0.11)	0.111 (0.10)
Married and living together	0.287*** (0.04)	0.291*** (0.04)	0.294*** (0.04)
Divorced or widowed	-0.065 (0.07)	0.043 (0.07)	-0.048 (0.07)
Religion is important	0.588*** (0.06)	0.426*** (0.06)	0.518*** (0.06)
<i>Education</i>			
School completion (less than 7th)	0.103 (0.08)	0.311*** (0.08)	0.181* (0.09)
School completion (7th-11th)	0.174* (0.08)	0.401*** (0.08)	0.251** (0.08)
High school	0.387*** (0.09)	0.603*** (0.09)	0.476*** (0.09)
College - BA, MA or Doctorate	0.511***	0.921***	0.763***

	(0.13)	(0.13)	(0.13)
<i>Employment</i>			
Employed	0.356*** (0.05)	0.377*** (0.05)	0.324*** (0.05)
Not Economically Active	0.107* (0.05)	0.040 (0.05)	0.086 (0.05)
<i>Housing Characteristics</i>			
Formal dwelling (apt. or house, typically brick)	0.188*** (0.05)	0.219*** (0.05)	0.207*** (0.06)
Informal dwelling or other	0.122 (0.07)	0.121 (0.07)	0.135 (0.07)
Electricity	0.286*** (0.05)	0.202*** (0.05)	0.128* (0.05)
Flush toilet	0.153*** (0.04)	0.191*** (0.04)	0.229*** (0.04)
<i>Respondent Health</i>			
Fair health	-0.030 (0.12)	-0.088 (0.12)	0.136 (0.13)
Good health	0.182 (0.11)	-0.060 (0.12)	0.358** (0.12)
Very good health	0.360** (0.11)	-0.002 (0.12)	0.537*** (0.12)
Excellent health	0.441*** (0.11)	0.135 (0.12)	0.651*** (0.12)
Constant	4.811*** (0.24)	4.071*** (0.25)	3.423*** (0.24)
R-sqr	0.112	0.098	0.102
dfres	19915	19708	20228
BIC	89283.7	88375.4	91275.5

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

Standard errors reported in parentheses

Dependent variable: satisfaction (1 = very dissatisfied 10 = very satisfied)

Table 3a. Pooled Cross Section and Panel Regressions (complete), NIDS (2012-2017)

	Pooled CS	Fixed Effects	Random Effects
<i>Mobility and Expenditure</i>			
Positive intergenerational mobility	0.458*** (0.03)	0.404*** (0.04)	0.457*** (0.03)

Negative intergenerational mobility	-0.025 (0.05)	0.028 (0.07)	-0.023 (0.05)
Education higher than parent	-0.102** (0.03)	-0.080 (0.08)	-0.103** (0.03)
Education lower than parent	0.119* (0.06)	0.091 (0.12)	0.119* (0.06)
Expenditure in 1000R	0.016*** (0.00)	0.011*** (0.00)	0.016*** (0.00)
<i>Respondent Characteristics</i>			
Female	0.029 (0.03)		0.029 (0.03)
African	-1.015*** (0.07)		-1.016*** (0.07)
Asian or Indian	-0.260* (0.11)		-0.261* (0.11)
Coloured	-0.023 (0.08)		-0.023 (0.08)
Married and living together	0.319*** (0.03)	0.237** (0.09)	0.319*** (0.03)
Divorced or widowed	0.152*** (0.04)	0.102 (0.10)	0.153*** (0.04)
Religion is important	0.588*** (0.05)	0.487*** (0.08)	0.558*** (0.05)
<i>Education</i>			
School completion (less than 7th)	0.058 (0.05)	-0.359 (0.25)	0.057 (0.05)
School completion (7th-11th)	0.100 (0.05)	-0.212 (0.27)	0.100 (0.05)
High school	0.301*** (0.06)	-0.116 (0.29)	0.301*** (0.06)
College - BA, MA or Doctorate	0.620*** (0.09)	-0.163 (0.41)	0.621*** (0.09)
<i>Employment</i>			
Employed	0.332*** (0.04)	0.186** (0.07)	0.329*** (0.04)
Not Economically Active	0.203*** (0.04)	-0.031 (0.07)	0.199*** (0.04)
<i>Housing Characteristics</i>			
Formal dwelling (apt. or house, typically brick)	0.189*** (0.04)	0.015 (0.07)	0.186*** (0.04)
Informal dwelling or other	0.067 (0.06)	0.016 (0.07)	0.067 (0.06)

	(0.06)	(0.11)	(0.06)
Electricity	0.182***	0.152*	0.183***
	(0.04)	(0.07)	(0.04)
Flush toilet	0.238***	0.222**	0.238***
	(0.03)	(0.08)	(0.03)
<i>Respondent Health</i>			
Fair health	-0.018	-0.056	-0.020
	(0.08)	(0.11)	(0.08)
Good health	0.148*	0.024	0.144
	(0.07)	(0.11)	(0.07)
Very good health	0.303***	0.260*	0.299***
	(0.07)	(0.11)	(0.07)
Excellent health	0.361***	0.295**	0.358***
	(0.08)	(0.11)	(0.08)
Wave 4	0.393***	0.460***	0.394***
	(0.03)	(0.04)	(0.03)
Wave 5	0.412***	0.524***	0.413***
	(0.03)	(0.04)	(0.03)
Constant	3.869***	3.885***	3.878***
	(0.13)	(0.27)	(0.13)
R-sqr	0.117	0.036	
dfres	18803	18803	
BIC	153334.7	125088.6	

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

Standard errors reported in parentheses

Dependent variable: satisfaction (1 = very dissatisfied 10 = very satisfied)

Table 4a. Fixed Effects Regressions by Generation Cohorts (complete), NIDS (2012-2017)

	Apartheid	Post-Apartheid
<i>Mobility and Expenditure</i>		
Positive intergenerational mobility	0.496***	0.246***
	(0.05)	(0.07)
Negative intergenerational mobility	0.084	-0.068
	(0.08)	(0.11)
Education higher than parent	-0.111	-0.054
	(0.12)	(0.12)
Education lower than parent	0.245	-0.042
	(0.17)	(0.17)
Expenditure in 1000R	0.009*	0.015**
	(0.00)	(0.01)

Respondent Characteristics

Female

African

Asian or Indian

Coloured

Married and living together	0.254*	0.194
	(0.12)	(0.13)
Divorced or widowed	0.146	-0.031
	(0.12)	(0.30)
Religion is important	0.467***	0.512***
	(0.10)	(0.12)

Education

School completion (less than 7th)	-0.273	-0.665
	(0.27)	(0.82)
School completion (7th-11th)	-0.148	-0.493
	(0.30)	(0.83)
High school	0.197	-0.572
	(0.35)	(0.85)
College - BA, MA or Doctorate	0.109	-0.657
	(0.49)	(0.98)

Employment

Employed	0.145	0.211*
	(0.10)	(0.09)
Not Economically Active	-0.031	-0.052
	(0.10)	(0.09)

Housing Characteristics

Formal dwelling (apt. or house, typically brick)	-0.013	0.075
	(0.08)	(0.12)
Informal dwelling or other	0.051	0.024
	(0.15)	(0.16)
Electricity	0.102	0.253*
	(0.08)	(0.11)
Flush toilet	0.293**	0.140
	(0.11)	(0.11)

Respondent Health

Fair health	-0.145 (0.12)	0.697 (0.36)
Good health	-0.014 (0.11)	0.433 (0.34)
Very good health	0.266* (0.12)	0.609 (0.34)
Excellent health	0.197 (0.13)	0.767* (0.34)
Wave 4	0.429*** (0.05)	0.523*** (0.06)
Wave 5	0.469*** (0.05)	0.635*** (0.07)
Constant	3.918*** (0.30)	3.634*** (0.90)
R-sqr	0.036	0.042
dfres	11391	7411
BIC	78729.9	46479.4

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

Standard errors reported in parentheses

Dependent variable: satisfaction (1 = very dissatisfied 10 = very satisfied)

Table 5a. Robustness Check – African only sample

	Cohort Pre-apartheid	Cohort Post-apartheid
Positive intergenerational mobility	0.498*** (0.05)	0.263*** (0.07)
Negative intergenerational mobility	0.104 (0.09)	-0.076 (0.12)
Education higher than parent	-0.153 (0.14)	-0.091 (0.13)
Education lower than parent	0.391* (0.20)	-0.052 (0.18)
Expenditure in 1000R	0.012 (0.01)	0.021** (0.01)
Female		
African		
Asian or Indian		

Coloured		
Married and living together	0.228 (0.13)	0.209 (0.13)
Divorced or widowed	0.184 (0.13)	-0.141 (0.32)
Religion is important	0.416*** (0.11)	0.528*** (0.12)
School completion (less than 7th)	-0.215 (0.28)	-0.177 (1.00)
School completion (7th-11th)	-0.090 (0.32)	0.069 (1.01)
High school	0.264 (0.39)	-0.090 (1.03)
College - BA, MA or Doctorate	0.088 (0.53)	0.050 (1.14)
Employed	0.146 (0.10)	0.201* (0.10)
Not economically active	-0.023 (0.10)	-0.029 (0.10)
Formal dwelling	-0.039 (0.08)	0.097 (0.12)
Informal dwelling or other	-0.041 (0.16)	-0.059 (0.17)
Electricity	-0.006 (0.09)	0.260* (0.11)
Flush toilet	0.385*** (0.11)	0.219 (0.12)
Fair health	-0.022 (0.13)	0.737 (0.38)
Good health	0.114 (0.12)	0.527 (0.35)
Very good health	0.435*** (0.13)	0.741* (0.35)
Excellent health	0.368** (0.14)	0.884* (0.35)
wave4	0.493*** (0.05)	0.579*** (0.07)
wave5	0.606*** (0.05)	0.684*** (0.07)
Constant	3.571*** (0.30)	2.748** (1.07)
R-sqr	0.046	0.050
dfres	8734	6276
BIC	63168.0	40242.6

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

Table 6a. Robustness Check – No expenditure outliers

	Apartheid Cohort	Post-apartheid Cohort
Positive intergenerational mobility	0.496*** (0.05)	0.245*** (0.07)
Negative intergenerational mobility	0.084 (0.08)	-0.060 (0.11)
Education higher than parent	-0.111 (0.12)	-0.055 (0.12)
Education lower than parent	0.245 (0.17)	-0.034 (0.17)
Expenditure in 1000R	0.009* (0.00)	0.021** (0.01)
Female		
African		
Asian or Indian		
Coloured		
Married and living together	0.254* (0.12)	0.189 (0.13)
Divorced or widowed	0.146 (0.12)	-0.035 (0.29)
Religion is important	0.467*** (0.10)	0.512*** (0.12)
School completion (less than 7th)	-0.273 (0.27)	-0.668 (0.82)
School completion (7th-11th)	-0.148 (0.30)	-0.495 (0.83)
High school	0.197 (0.35)	-0.572 (0.85)
College - BA, MA or Doctorate	0.109 (0.49)	-0.665 (0.98)
Employed	0.145 (0.10)	0.208* (0.09)
Not economically active	-0.031 (0.10)	-0.052 (0.09)
Formal dwelling	-0.013 (0.08)	0.074 (0.12)
Informal dwelling or other	0.051 (0.15)	0.028 (0.16)

Electricity	0.102 (0.08)	0.256* (0.11)
Flush toilet	0.293** (0.11)	0.140 (0.11)
Fair health	-0.145 (0.12)	0.721* (0.36)
Good health	-0.014 (0.11)	0.437 (0.34)
Very good health	0.266* (0.12)	0.616 (0.34)
Excellent health	0.197 (0.13)	0.773* (0.34)
Wave 4	0.429*** (0.05)	0.515*** (0.06)
Wave 5	0.469*** (0.05)	0.624*** (0.07)
Constant	3.918*** (0.30)	3.608*** (0.90)
R-sqr	0.036	0.043
dfres	11390	7411
BIC	78727.2	46467.8

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

Table 7a. Robustness Check - No Top-Ups

	Apartheid Cohort	Post-Apartheid Cohort
Positive social mobility	0.496*** (0.05)	0.246*** (0.07)
Negative social mobility	0.084 (0.08)	-0.068 (0.11)
Education higher than parent	-0.111 (0.12)	-0.054 (0.12)
Education lower than parent	0.245 (0.17)	-0.042 (0.17)
Expenditure in 1000R	0.009* (0.00)	0.015** (0.01)
Female		
African		
Asian or Indian		
Coloured		
Married and living together	0.254*	0.194

	(0.12)	(0.13)
Divorced or widowed	0.146	-0.031
	(0.12)	(0.30)
Religion is important	0.467***	0.512***
	(0.10)	(0.12)
School completion (less than 7th)	-0.273	-0.665
	(0.27)	(0.82)
School completion (7th-11th)	-0.148	-0.493
	(0.30)	(0.83)
High school	0.197	-0.572
	(0.35)	(0.85)
College - BA, MA or Doctorate	0.109	-0.657
	(0.49)	(0.98)
Employed	0.145	0.211*
	(0.10)	(0.09)
Not economically active	-0.031	-0.052
	(0.10)	(0.09)
Formal dwelling	-0.013	0.075
	(0.08)	(0.12)
Informal dwelling or other	0.051	0.024
	(0.15)	(0.16)
Electricity	0.102	0.253*
	(0.08)	(0.11)
Flush toilet	0.293**	0.140
	(0.11)	(0.11)
Fair health	-0.145	0.697
	(0.12)	(0.36)
Good health	-0.014	0.433
	(0.11)	(0.34)
Very good health	0.266*	0.609
	(0.12)	(0.34)
Excellent health	0.197	0.767*
	(0.13)	(0.34)
Wave 4	0.429***	0.523***
	(0.05)	(0.06)
Wave 5	0.469***	0.635***
	(0.05)	(0.07)
Constant	3.897***	3.628***
	(0.30)	(0.90)
R-sqr	0.036	0.042
dfres	10715	7178
BIC	76914.2	45871.0

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

Table 8a. Test for Attrition

	Apartheid Cohort	Post-Apartheid Cohort
Positive intergenerational mobility	0.453*** (0.07)	0.238* (0.10)
Negative intergenerational mobility	0.083 (0.13)	0.069 (0.18)
Education higher than parent	-0.024 (0.17)	0.000 (0.18)
Education lower than parent	0.068 (0.24)	-0.283 (0.28)
Expenditure in 1000R	0.017** (0.01)	0.015 (0.01)
Female	0.000 (.)	0.000 (.)
African	0.000 (.)	0.000 (.)
Asian or Indian	0.000 (.)	0.000 (.)
Coloured	0.000 (.)	0.000 (.)
Married and living together	0.297 (0.18)	0.187 (0.19)
Divorced or widowed	0.280 (0.17)	0.164 (0.48)
Religion is important	0.619*** (0.15)	0.471** (0.17)
School completion (less than 7th)	-0.497 (0.36)	0.222 (1.05)
School completion (7th-11th)	-0.614 (0.41)	0.229 (1.06)
High school	-0.546 (0.52)	0.297 (1.09)
College - BA, MA or Doctorate	-0.201 (0.69)	-0.880 (1.34)
Employed	0.394** (0.13)	0.290* (0.13)
Not economically active	0.073	0.005

	(0.13)	(0.14)
Formal dwelling (apt. or house, typically brick)	0.184	0.361*
	(0.13)	(0.18)
Informal dwelling or other	0.069	0.049
	(0.22)	(0.26)
Electricity	0.141	0.365*
	(0.13)	(0.17)
Flush toilet	0.002	0.087
	(0.16)	(0.17)
Fair health	-0.177	0.482
	(0.17)	(0.48)
Good health	-0.041	0.441
	(0.17)	(0.45)
Very good health	0.152	0.389
	(0.17)	(0.45)
Excellent health	0.055	0.675
	(0.18)	(0.45)
wave4	0.453***	0.580***
	(0.06)	(0.08)
wave5	0.000	0.000
	(.)	(.)
nextw	0.162	0.218
	(0.11)	(0.14)
Constant	3.730***	2.505*
	(0.44)	(1.18)
R-sqr	0.048	0.057
dfres	9554	6059
BIC	45672.5	26405.7

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

Brophy et al. (2018) Table 2.9: Wave on wave attrition by race*

	Pop. Group	Refusal	Non-Contact	Deceased	Total	Attrition Rate
Wave 5	African	2190	2006	635	4831	11.84
	Coloured	673	426	121	1220	18.68
	Asian or Indian	138	95	5	238	44.82
	White	475	512	23	1010	62.69
	Total	3481	3040	784	7305	14.76
Wave 4	African	1410	1489	717	3616	11.17
	Coloured	419	369	120	908	16.75
	Asian or Indian	117	86	10	213	43.74

	White	348	456	35	839	54.41
	Total	2294	2400	882	5576	14.01
Wave 3	African	1366	1748	580	3694	13.37
	Coloured	488	281	98	867	18.3
	Asian or Indian	122	41	5	168	36.44
	White	505	206	25	736	50.07
	Total	2481	2276	708	5465	15.94

*Taken from NIDS Panel User Manual (Brophy et al. 2018)

Table 9a. Interaction Terms Regression

	(1) Satisfaction Level (1 to 10) b/se
Female	0.000 (.)
Expenditure in 1000R	0.009* (0.00)
African	0.000 (.)
Asian or Indian	0.000 (.)
Coloured	0.000 (.)
Married and living together	0.254* (0.12)
Divorced or widowed	0.146 (0.12)
School completion (less than 7th)	-0.273 (0.27)
School completion (7th-11th)	-0.148 (0.30)
High school	0.197 (0.35)
College - BA, MA or Doctorate	0.109 (0.49)
Positive intergenerational mobility	0.496*** (0.05)
Negative intergenerational	0.084

mobility	(0.08)
Education higher than parent	-0.111
	(0.12)
Education lower than parent	0.245
	(0.17)
Formal dwelling (apt. or house, typically brick)	-0.013
	(0.08)
Informal dwelling or other	0.051
	(0.15)
Electricity	0.102
	(0.08)
Flush toilet	0.293**
	(0.11)
Employed	0.145
	(0.10)
Not economically active	-0.031
	(0.10)
Fair health	-0.145
	(0.12)
Good health	-0.014
	(0.11)
Very good health	0.266*
	(0.12)
Excellent health	0.197
	(0.13)
Religion is important	0.467***
	(0.10)
wave4	0.429***
	(0.05)
wave5	0.469***
	(0.05)
g2_expend1000	0.006
	(0.01)
g2_married_cohab	-0.060
	(0.17)
g2_divorce_widowed	-0.177
	(0.32)
g2_edu_some_school	-0.392
	(0.86)
g2_edu_gr7_11	-0.344
	(0.88)
g2_edu_hs	-0.769
	(0.92)
g2_edu_ma_doc	-0.767

	(1.09)
g2_ladder_up	-0.250**
	(0.08)
g2_ladder_down	-0.153
	(0.14)
g2_edu_higher_par	0.057
	(0.17)
g2_edu_lower_par	-0.287
	(0.24)
g2_dwl_formal	0.088
	(0.14)
g2_dwl_informal	-0.027
	(0.22)
g2_elec	0.152
	(0.14)
g2_flush_toi	-0.154
	(0.16)
g2_employ_emp	0.067
	(0.13)
g2_employ_not_active	-0.020
	(0.13)
g2_health_fair	0.841*
	(0.38)
g2_health_good	0.447
	(0.36)
g2_health_vgood	0.344
	(0.36)
g2_health_exc	0.570
	(0.36)
g2_religion_import	0.046
	(0.15)
g2_wave4	0.094
	(0.08)
g2_wave5	0.166*
	(0.08)
Constant	3.812***
	(0.39)
<hr/>	
R-sqr	0.038
dfres	18803
BIC	125263.0
<hr/>	

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

Interaction between cohort 2 (post-apartheid) and covariates used in analysis.
Robust standard errors reported in parentheses.