Fractionalization and Well-Being: Evidence from a new South African data set.

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Abstract

This paper aims to test whether a number of fractionalization variables that capture cultural and economic diversity have any impact on reported satisfaction as well as happiness. Controlling for standard economic and non-economic variables, we test whether (i) ethno-linguistic, (ii) religious and (iii) income fractionalization at the cluster level have any impact on well-being. The findings indicate that income fractionalization consistently predicts lower subjective life satisfaction when the individual's household income is controlled for, and that religious fractionalization is correlated with lower life satisfaction. Ethno-linguistic fractionalization though does not correlate with life satisfaction. Extensions of the model include adding interaction terms which indicate that ethno-linguistic fractionalization is important to specific ethno-linguistic groups.

I Introduction

Empirical evidence on what causes economic growth shifted focus in the late 1990s towards what has been termed by Rodrik as deep causes of growth. These can be thought of as institutional quality (e.g. property rights, credible legal systems) and governance (Hall and Jones, 1999; Acemoglu et al. 2001; Easterly and Levine, 2003; Rodrik et al. 2002). Extensions to this work have focused on issues of trust within countries and on the importance of cultural diversity (Knack and Keefer, 1997; Zak and Knack, 2001). The cultural diversity and in particular the ethnic and religious diversity of a country can be an important predictor of a number of economic and non-economic outputs. Cross-country research by Mauro (1995), Easterly and Levine (1997), Montalvo and Reynal-Querol (2005), and La Porta et al. (1999) indicates that ethnolinguistic diversity, captured by ethnolinguistic fractionalization, can have

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negative connotations for investment, economic growth and quality of governance. Religious diversity tends not to be significant in cross-country growth equations or in predicting poor governance (e.g. Barro (1997a,b), Tavares and Wacziarg (2001) and Alesina et al (2003)). Ethnic fractionalization is a significant predictor of civil wars according to Montalvo and Reynal-Querol (2002, 2005) while Collier (2000) finds ethnic dominance to help predict civil conflict.

More recently, ethnic and religious fractionalization have been included in models of trust and, to a lesser extent, wellbeing. La Porta et al. (1997) find evidence that Catholics, Orthodox Christians and Muslims are less trusting, when compared to other religious groups, while Uslaner (2002) finds Protestantism to predict more trust. Bjornskov (2006) finds that, in countries where Catholicism or Islam is dominant, trust levels are predicted to be lower. Given that more trust means higher growth rates (Knack and Keefer, 1997; Zak and Knack, 2001) religion can be considered to be a deep cause of economic growth through its impact on general trust levels.

Mookerjee and Beron (2005) find that religious fractionalization is correlated with reduced happiness. Okulicz-Kozaryn (2011) uses a variety of data, including wellbeing data from the World Values Surveys, to calculate religious fractionalization and polarization. While not considering personality traits (akin to fixed effects) or religious denomination the findings indicate that increasing religious fractionalization can have a negative impact on life satisfaction. This finding is explained by the bond within a (religious) group being outweighed by the lack of bridging between (religious) groups. Too much within-group bonding can result in a polarized position between groups that causes the life satisfaction of all to decline. Such an explanation draws on the work of Putnam (2001) and may well be the cause of between group animosity and violence[2].

[2] Type of political system is known to be an important predictor of whether between group violence occurs, with Collier (2000, 2001) arguing that ethnic fragmentation is less disruptive in democracies. The explanation is that minorities feel more represented in a democracy and less oppressed than under dictatorships.

This paper contributes to the literature by looking at three types of fractionalization within the highly unequal middle-income country of South Africa and how they impact on life satisfaction.

South Africa represents an interesting focus for this research for several reasons. The Apartheid system at its heart was a system built on racism that, amongst other things, prohibited freedom of movement. Eighteen years since this system officially ended and there remain severe racial differences particularly regarding income inequality (Leibbrandt et al. 2001, Ardington et al, 2006, Ozler, 2007) and the labour market (Allanson et al 2002; Hinks and Brooks, 2004; Allanson and Atkins, 2005). Whether individuals of different ethnicity are equally tolerant of each other today is unknown but given the divisive nature of Apartheid it could be that an intolerance of people from different ethno-linguistic groups persists.

The income gap between all individuals measured by the Gini coefficient has been interpreted as a measure of social polarization (Bjornskov, 2006) and this is the first fractionalization term that is included in our life satisfaction equation. Whether this characteristic of South Africa is at all important in life satisfaction has not been formally tested before. It could be that people in highly unequal areas accept this inequality as readily as those living in relatively less unequal areas, so that there is no relationship with life satisfaction. Given that we control for ethno-linguistic group in our models, and thereby pick up racial grievances associated with the past as well as race-specific expectations, any negative impact of income inequality will be interpreted as evidence of social polarization and a disconnectedness of people within districts.

Ethno-linguistic and religious fractionalization, are the remaining focus of the paper. Since Blacks comprise 80 per cent of the population, most areas will be dominated by this racial group, with many areas having no racial fractionalization. A lack of geographical racial diversity is one of the legacies of the apartheid regime. During this time, non-whites found their economic and social movement restricted resulting, amongst other things, in housing segregation. Given South Africa has 11 official languages in South Africa (Constitution of the Republic of South Africa, 1996) with nine of these being African languages it is important to realize that there are ethnic

differences amongst Blacks. The majority (80 per cent) of people in South Africa classify themselves as of Christian denomination (CIA, 2012). Following Bjornskov's (2006) social polarization idea, it may be expected that life satisfaction declines in ethno-linguistic and religious fractionalization which is explained by an intolerance of other groups within the neighbourhood.

The following section reviews some of the previous work on what causes life satisfaction, with empirical evidence from developing countries including South Africa. Section III provides a description of the data used, as well as a discussion of the subjective well-being findings by racial group. Section IV will present the model to be estimated and the descriptive statistics. Section V will discuss the results and their robustness to specification changes. A conclusion follows.

II Life Satisfaction and Empirical Evidence for Developing Countries

The term life satisfaction is frequently interchanged with happiness, subjective well-being and quality of life in the empirical economic literature.[3] The investigation into happiness began with Easterlin (1974), who found no relationship between income per capita and happiness over time. Since orthodox economics predicts that more income will result in greater utility/happiness, this was somewhat surprising and is known as the Easterlin paradox. In the 1990s, more empirical and theoretical research emerged on the economics of happiness, pioneered by psychologists including Ed Deiner, Martin Seligman and Richard Lucas, economists such as Richard Layard, Andrew Clark, Andrew Oswald and Rainer Winkelmann and the sociologist Ruut Veenhoven[4]. One of the interesting predictions of the happiness literature is that people adapt to changing circumstances, whether these be positive or negative, so that any changes in happiness are temporary with individuals reverting back to some 'set-point' level of utility towards which they will always tend. It is a similar concept to the earlier work of Brickman and Campbell (1971) who argued that people are on a

[3] Currently the dominant view is that both 'quality of life' and 'subjective well-being' are umbrella terms (see, for example, World Health Organisation Quality of Life Group, 1995 and Diener, 2006). Happiness is normally defined as a positive affect but can also be thought of as a universal evaluation of a person's life satisfaction (Camfield and Skevington 2008, p.768). Life satisfaction is thus a subordinate term to the general concept of happiness.

[4] A number of books have been written on the subject including Layard (2005), Frey and Stutzer (2002) and Easterlin (2010).

'hedonic treadmill' and adapt to economic conditions. Time plays a crucial role in these adaptation theories.

Recently, the Easterlin paradox has itself been questioned by Stevenson and Wolfers (2008), who find that there is a clear positive link between subjective wellbeing and income per capita over time. Easterlin and Angelescu (2009) respond that it is over the long term that this paradox holds firm. Cross-sectional empirical work (Veenhoven, 1991; Clark and Oswald, 1996; Blanchflower et al. 1993) has found that, while those with higher incomes do report higher level of happiness, these do not tend to change upwards over time in any statistically significant way.

Attempts to transform South Africa into a more equitable society have involved numerous economic and welfare policies, including employment equity legislation and a variety of income redistribution schemes such as means tested pensions and child support. However, racial differences remain stubbornly high. Employment likelihood studies (Kingdon and Knight, 2004a,b; Hinks and Brookes, 2004) and earnings studies (Hinks and Watson, 2001; Allanson et al. 2002; Allanson and Atkins, 2005) consistently show a racial hierarchy, with whites best off, followed by Indians, coloureds and Blacks. Racial employment and earnings discrimination is still apparent too (ibid.), though this is harder to measure and may reflect omitted variable bias (e.g. personality traits, expectations). Female participation rates have increased in the post-apartheid era, as have the number of smaller (single) female-headed households reflecting greater independence. The gender earnings and employment gap remains both between and within racial groupings (Hinks, 2002; Casale and Posel, 2002; Grün, 2004).

How race impacts on subjective well being in South Africa has been tested extensively. Møller (1989, 1994, 1998, 2000, 2007) utilizes data from the South African Quality of Life Trends project which later evolved into the General Household Survey. Using descriptive statistics Møller consistently found a racial hierarchy where blacks reported the lowest life satisfaction, followed by coloureds, Indians then whites. This hierarchy was confirmed when using several different quality of life terms. Møller (2001) analyses the trends in happiness in the post-Apartheid period and finds that the racial gap has declined due to decreases amongst

whites, Indians and coloureds and a slight increase amongst blacks. That black South African satisfaction has increased slightly in the 2000s could represent a cognitive coping mechanism that acts to inflate satisfaction levels or it could be due to improvements in quality of life such as access to electricity, better housing and more geographical mobility. Certainly amongst the new black middle class and black elite satisfaction levels have improved in the post-Apartheid period as income has increased and Møller (2007) argues that income and satisfaction are correlated without formally testing this.

The statistical relationship between satisfaction and income has been analysed in the work of Powdthavee (2005, 2007), Kingdon and Knight (2007) and Hinks and Grün (2007) using October Household Surveys, the 1993 South African Labour Research Unit (SALDRU) household survey, and the Durban Quality of Life Studies respectively. In all of the studies income positively contributes to life satisfaction. What these studies also reveal is that even when income and other socio-economic variables, notably economic activity, are controlled for in satisfaction equations that race is still important. In all of the studies, blacks are significantly less happy than other racial groups, followed closely by coloureds, and then by Indians and whites. That blacks and coloureds are less satisfied with life could be attributable to the legacy of apartheid that still causes unhappiness today. Some of this unhappiness will be picked up by those who experienced Apartheid and happiness equations always control for age, so there are likely to be other explanations as well. One could be that expectations have not been fulfilled. The wave of positive emotion recorded by Møller (1998) immediately after the first all-party election in 1994 was soon replaced by a return to some lower level of satisfaction. It could be that economic expectations have not been fulfilled and that blacks and coloureds are not willing to adapt these expectations downwards hence they are unhappier/less satisfied with life relative to whites. This decline in satisfaction can be explained by set-point theory (Lucas et al, 2004) or the hedonic treadmill (Brickman and Campbell, 1971), both of which predict that satisfaction reverts back to some preconditioned level.

III Data

The South Black National Income and Dynamics Survey (NIDS) is a nationally representative household survey collecting detailed household and individual

information on approximately 7,300 households and 28,000 individuals in South Africa. As well as standard information on individual and household characteristics, such as economic activity and income and expenditure, NIDS provides new information in a number of areas including objective and subjective health, emotional wellbeing and social capital. NIDS is designed to be a panel data set but only wave 1 for 2008 is presently available. Hence individual fixed effects cannot yet be controlled for here.

The life satisfaction questions in NIDS use a Likert scale from 1 (very dissatisfied) to 10 (very satisfied). For our working sample, the distribution of subjective well-being (SWB) scores is provided in Figure 1. Extreme values of SWB prevent a bell-shaped distribution. This is a common finding in the literature and can have implications for the estimation of happiness equations, which are discussed in Section IV. Whites report the highest average life satisfaction, followed by Indians, Coloureds and Blacks (see Table 1).

Insert Figure 1 here

When extreme values of SWB are taken into account, the racial hierarchy remains, with median SWB scores all being lower.

Insert Table 1 here

These findings are consistent with previous happiness work in South Africa (Powdthavee, 2005, 2007; Hinks and Grun, 2007; Kingdon and Knight, 2007). That the SWB gap between Blacks and whites is 1.9 (2.4 using median SWB) illustrates the importance race appears to play in South Africa. This is perhaps expected given the legacy of apartheid, but the scale of difference, 14 years after apartheid ended, is perhaps not expected. One way to check this gap is to look at life satisfaction evidence from around the 1994 period. Møller (1998) provides these comparisons using four waves of quality-of-life survey data gathered in the 1980s and 1990s. The impact of 1994 on life satisfaction is clear in the average scores with Black satisfaction more than doubling in this year before falling back again (See Table 2). The racial SWB gap between Blacks and whites is over 2 in 1995, having been far

greater in the 1980s due almost entirely to larger satisfaction scores for whites. Direct comparisons across time and using different data sources are not a satisfactory way of addressing the size of this gap but they do indicate that a historic gap exists between Blacks and whites, in particular, and that this has always been relatively large.

Insert Table 2 here

IV Methodology and Descriptive Statistics

Given the ordered nature of the Likert scale an ordered probit or ordered logit model is the most appropriate to use here. We adopt the ordered probit model which assumes the underlying actual satisfaction of an individual is normally distributed. The ordered logit assumes actual satisfaction has a logistic distribution. The self reported life satisfaction of an individual, as measured by a value on the Likert scale, is related to the person's actual life satisfaction by the following,

$$RS_i = g(AS_i(X_i)) + e_i \quad (1)$$

RS is the reported satisfaction level that is related, by a continuous non-differentiable function (g), to the actual satisfaction of the person (AS). AS is determined by individual characteristics, as well as economic, non-economic and regional factors that are included in X_i.

Following Alesina and La Ferrera (2005) the Herfindahl index is used for calculating ethno-linguistic and religious fractionalization,

$$H = 1 - \sum_i s_{ic}^2 \quad (2)$$

where S_{ic} represents the share of 'i' in the population of the household cluster 'c', where 'i' is either race, language or religion. Household cluster is the smallest geographical area in the NIDS data set, thus capturing unobserved neighbourhood effects. 'H' is increasing in the heterogeneity of 'i' and the expectation is that life satisfaction decreases with increased heterogeneity. To test this hypothesis squared

fractionalization terms are also included in our happiness equation. The Gini coefficient is calculated at the district council level.

The regression we formally model is,

$$RS_i = \beta_1 EthnoLinguistic + \beta_2 \text{Religious} + \beta_3 Gini + \underline{\chi} X_i + \varepsilon_i \quad (3)$$

where the error term ε_i is normally distributed. The socio-economic characteristics of the individual and the neighbourhood are included in X_i and are informed by previous work in the happiness economics literature. Absolute income per capita of the household and median income in the cluster are used to test for the relationship between income and life satisfaction. It is expected that richer people will report more life satisfaction. It is unclear how median income of cluster will impact on life satisfaction. Those living in richer neighbourhoods may be less satisfied since they feel relatively poorer or, alternatively, more satisfied because local amenities (e.g. health services) are better.

We use body mass index (BMI) as an objective measure of health and calculate whether someone is underweight, of appropriate weight or overweight. Work by Felton and Graham (2005), Stutzer (2006), and Oswald and Powdthavee (2007), indicates that both overall happiness and psychological distress are negatively affected by BMI. The model also controls for education level, marital status, economic activity, membership of a group, age and regional residence.

Descriptive statistics are provided in Table 3 and indicate that the largest average fractionalization index is the Gini coefficient. At 0.55, this represents a somewhat lower figure compared with alternative sources that estimate the Gini to be in the range 0.60-0.65.[5] The figure is still high by international standards though. There is some ethno-linguistic fractionalization and religious fractionalization in South Africa with the averages being 0.31 and 0.36 respectively. For both indices the most frequent value is zero indicating no ethno-linguistic diversity in South Africa. Further

[5] See World Bank (1996) and CIA (2012).

examination of the data reveals that no ethno-linguistic diversity is commonly found in Kwazulu-Natal province that is dominated by Zulu speakers and in the Eastern Cape that is dominated by Xhosa speakers. Religious unity tends to be focused in those neighbourhoods located in the Northern, Western and Eastern Cape. Average per capita income is just over R1,200 per month and if we remove the non-economically active, there is a searching or 'strict' unemployment rate of 21.6 per cent and a broad (searching+non-searching) rate of 32.9 per cent. The unemployment figures are in line with official Statistics South Africa figures, which has strict unemployment at 24 per cent in 2009 (UNDP, 2010). The descriptive statistics indicate NIDS 2008 is a highly credible data set when compared with official data sources.

V Results

In all of the estimations in Table 4, the standard errors control for household clustering effects so that unobserved neighbourhood characteristics are considered that will improve the robustness of results. In Model I the fractionalization terms are included in the satisfaction equations. Increases in both the Gini coefficient and religious fractionalization are associated with lower life satisfaction, but only the religious term is statistically significant. The sign, if not the significance on these two indices, is as expected. Greater ethno-linguistic fractionalization predicts more life satisfaction which is counter to what we expect and is consistent with a nation that enjoys diversity. While Model I reveals interesting results for the ethno-linguistic term Model II indicates that this finding is not at all robust and that belonging to a specific ethno-linguistic group, being a member of a particular religion, or one's own level of income all directly correlate with life satisfaction, as well as determining the extent of fractionalization[6].

Whites, Coloureds and Indians who speak either English or Afrikaans are all more satisfied with life than Blacks who speak Zulu in the home. This is consistent with previous work by Powdthavee (2005, 2007) Hinks and Grun (2007) and Kingdon and Knight (2007). Blacks who speak Ndebele and Setswana are less satisfied with their

[6] Life satisfaction was not found to be U-shaped in heterogeneity for any of the fractionalization terms indicating that greater heterogeneity predicts lower satisfaction.

lives relative to Zulu-speaking Blacks. The inclusion of ethno-linguistic groups does cause the ethno-linguistic fractionalization term to change sign but it is now statistically insignificant. While controlling for ethno-linguistic group is found to be important in predicting life satisfaction there still remains the question of whether the life satisfaction of these different groups are equally effected by ethno-linguistic fractionalization. For example, does the dialect that Black South Africans speak at home determine whether ethno-linguistic diversity increases or decreases life satisfaction? Model III includes the interaction terms and we find there are different effects on life satisfaction. English and Afrikaans speaking Coloureds are predicted to have lower life satisfaction when in more ethno-linguistically diverse neighbourhoods. An explanation for this result is not forthcoming from previous work in South Africa. Blacks who speak an unofficial language also see satisfaction decrease with ethno-linguistic fractionalization. Interestingly Blacks who speak Setswana tend to be more satisfied with their lives the greater the extent of ethno-linguistic fractionalization and the result is significant at the one per cent level. Setswana speakers made up the majority of the Apartheid era bantustan of Bophuthatswana. Unlike the bantustans of Transkei, Ciskei and Venda, Bophuthatswana was a geographical patchwork that comprised six enclaves, most (but not all) being located near the border of Botswana. In 1994 the bantustans were reintegrated into the new South Africa, with Bophuthatswana being split between the Free State, Northern Cape and North-West provinces. The location of Setswana speakers today remains similar to what they were in the apartheid era, with the majority located in the North-West province and the Northern Cape but also in Gauteng province.

It is beyond the scope of this paper to test why Setswana speakers are happier when located in neighbourhoods with greater ethnic and linguistic diversity compared to non-Setswana speakers. However, this result and that of Coloureds previously could be explained by the fact that any kind of fractionalization concept is dynamic and changes to fractionalization need to be researched. These changes may be related to issues of migration in and out of neighbourhoods and the impact this has on current residents. If, for example, there was increased migration of different ethno-linguistic groups to Cape Town in search of a better quality of life, what will be the impact on the life satisfaction of current residents of Cape Town?

Religious fractionalization remains significant and negatively effects life satisfaction from results reported in Model II. Muslims and members of other religions report being significantly more satisfied with their lives compared to Christians, while atheists are less happy with their lives. This is consistent with the work of Pollner (1989) and Myers (2008) who find that being a member of a religious group increases satisfaction level. Explanations for this finding include individuals deriving happiness from interacting with a supernatural imaginary being (Pollner, 1989) or that belief in a God somehow enables the individual to create a system for the meaning of their life (Ardelt, 2003). However whether religious denomination should impact on life satisfaction is less clear with Ellison (1991) finding Protestants to be happier than Catholics but Hayo (2007) and Greece and Yoon (2004) finding no difference by denomination. In order to test the robustness of this finding it was decided to interact religious group with religious fractionalization to test whether members of minority religious groups were more or less satisfied when there was more religious diversity in the neighbourhood. Model IV illustrates that Muslims do report higher levels of life satisfaction when religious fractionalization increases compared to non-Muslims, but that Muslims are now less satisfied with their lives compared to Christians. What Model IV also indicates is that members of 'Other' religions are significantly less satisfied with their lives the more religious fractionalization increases, but as a group they are still more satisfied than Christians. Atheists find their satisfaction decline if they live in more religiously diverse communities, but they are now significantly happier than Christians whereas in the previous model they were less satisfied. This last finding is new to the literature and indicates that a belief system based on religion is not necessary to increase life satisfaction, and for South Africans actually results in less life satisfaction. This result is completely dependent on modelling the individual's religious beliefs and the religious diversity of a neighbourhood together which captures how individuals perceive other groups.

Insert Table 3 here

The inclusion of household income per capita and average cluster level of income per capita results in the Gini coefficient becoming larger and statistically significant in Model II compared to being insignificant in Model I. That income inequality does not

directly affect satisfaction is unsurprising, since in richer areas, where the Gini coefficients could well be highest, everyone has a good quality of life and this over-rides social fractionalization. In poorer areas, where quality of life is (relatively and absolutely) low, any increase in income inequality may bring with it greater social fractionalization that will lower satisfaction levels. Only after controlling for levels of income is income inequality likely to be significant in cross-sectional satisfaction equations. The impact income per capita has on life satisfaction is positive and highly significant as predicted, whereas the average income per cluster is not significant meaning we reject the hypothesis that living in a richer district impacts on life satisfaction. In Model V a full set of controls are included and the Gini coefficient remains negative and highly significant. Those living in highly unequal areas, ceteris paribus, will have the lowest levels of life satisfaction. This is consistent with jealousy effects and highlights the importance people place on their relative position within their neighbourhood.

Model V controls for the full set of control variables, and the findings for the three fractionalization terms are robust to their inclusion. The control variables themselves are consistent with previous findings for South Africa and the wider happiness literature. Firstly, those with education are more satisfied with life than those with no schooling, with this satisfaction gap increasing with education. The well-known U-shaped relationship between satisfaction and age is revealed and is highly significant, with life satisfaction reaching a minimum at 49 years of age. Being a member of a group (e.g. membership of a stokvel or school committee) and the network effects this can yield, is associated with significantly higher levels of satisfaction. Those who are under-weight report significantly lower life satisfaction compared with those of an appropriate weight, while there is no impact on satisfaction from being obese. Being married is associated with more life satisfaction compared to never having being married, living together or divorced/widowed. Finally, being either strictly or broadly unemployed significantly impacts on life satisfaction when compared to someone who is employed, which is consistent with a scarring effect found in the literature.

VI Conclusion

In this paper we tested whether three types of fractionalization have any impact on life satisfaction using a cross-sectional data set for South Africa. South Africa represents

an interesting focus for this research for several reasons. The Apartheid system at its heart was a system built on racism that, amongst other things, prohibited freedom of movement. Eighteen years since this system officially ended and there remain severe racial differences particularly in the labour market despite numerous pieces of legislation designed to benefit previously disadvantaged groups. Whether more ethnically diverse neighbourhoods and complete freedom of movement is correlated with life satisfaction is a question that tests tolerance towards others. Given the divisive nature of Apartheid it could be that an intolerance of people from different ethno-linguistic groups persists today. It is found that ethno-linguistic fractionalization is not correlated with life satisfaction. Instead we found results that are consistent with previous work. Whites, Coloureds and Indians (who speak either English or Afrikaans) are more satisfied with life than the largest (Zulu-speaking) Black group. However when interaction terms are introduced it is found that the life satisfaction of Coloureds and Setswana speaking Blacks is correlated with ethno-linguistic diversity but that these effects are opposite to each other. The conclusion is that ethno-linguistic diversity of neighbourhoods is not important to the majority of South Africans' life satisfaction and that this is a positive finding for South Africa in the post-Apartheid era.

Increasing religious fractionalization is associated with reduced levels of life satisfaction even when religious group is controlled for. There was a weak finding that Muslims were more satisfied with life than Christians, but when religious fractionalization and religious group were interacted this was replaced by the (still) weak finding that Muslims' life satisfaction increased with greater religious diversity, while the opposite was true of atheists and members of 'Other' religious groups. Atheists were then found to be more satisfied with life than Christians after controlling for how they view religious diversity in their neighbourhood. This finding differs from previous work in the area that reports religious people as being happier.

Income inequality or 'social polarization' (Bjonskov, 2006) per se had no impact on life satisfaction, but the coefficient became significant and large in size when income level was included in the analysis. This may indicate that the impact of income inequality depends on how rich a household or a particular area is. Those people living in the poorest areas may be more adversely affected by increasing income

inequality, since social disconnection is not linear with respect to satisfaction. Instead, poor areas consist of those with enough income to survive well and those who do not. This divide could be something akin to a poverty line. In wealthier areas and suburbs, social polarization is not something that impacts on every day life satisfaction since everyone is above a poverty line. That income inequality negatively effects life satisfaction and is robust, indicates another reason why this issue is divisive in South Africa and why reducing income inequality both between but also within racial and ethno-linguistic groups is an important objective. It is this type of fractionalization that effect life satisfaction the most and requires further attention of policy makers.

Further research is required into the role migration plays in fractionalization and how fractionalization changes over time. The NIDS data set provides an opportunity to monitor migration and the resulting fractionalization patterns since it is a panel data set. On a more specific note, research is required as to why Coloureds seem to have a far greater intolerance to other groups when compared to other minority ethnic groups. Other work (Posel and Hinks, 2012) finds a similar result when testing the causes of trusting behaviour in South Africa.

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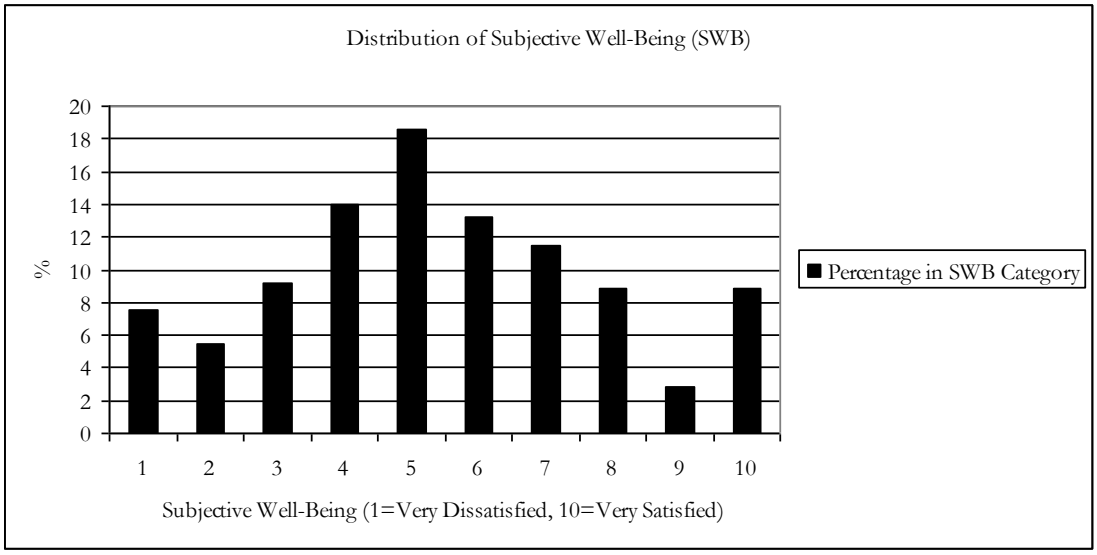
Figure 1



Authors calculations using NIDS (2008).

Table 1 Subjective Well-Being by Racial Group

	All	Black	White	Coloured	Indian
SWB Average	5.401	5.065	7.013	6.605	6.684
SWB Median	4.682	4.350	6.714	6.076	6.185
Observations	12,064	9,593	632	1,652	177

Authors calculations using NIDS (2008).

Table 2

	All	Black	White	Coloured	Indian
1983	5.5	4.4	8.9	8.0	8.8
1988	4.4	3.2	8.1	7.6	7.6
1994	7.9	7.9	7.7	7.6	7.0
1995	4.5	4.1	6.4	6.0	6.7

Based on Møller (1998, Table V, p.44). Original figures divided by 100 for direct comparisons with Table 1.

Table 3 Descriptive Statistics 2008 taken from the National Income Dynamics Study for South Africa

Variable Name	Average
Subjective Well Being (SWB)	5.399
Gini Coefficient	0.549
Ethno-linguistic Fractionalization (Using Herfindahl Index)	0.312
Religious Fractionalization(Using Herfindahl Index)	0.354
Black	0.804
White	0.136
Coloured	0.013
Indian	0.047
Christian	0.827
Jewish	0.003
Muslim	0.005
Hindu	0.009
Traditional Religion	0.044
Other Religion	0.043
No Religion	0.068
Ndebele	0.010
Xhosa	0.160
Zulu	0.298
Sepedi	0.082
Sesotho	0.083
Setswana	0.100
Siswati	0.022
Tshivenda	0.014
Xitsonga	0.023
Afrikaans	0.163
English	0.042
Other Language	0.002

Log per capita household income	6.355
Average per capita household income (Rands)	1212.37
Log Average Income by cluster	6.712
Under-weight	0.542
Good-weight	0.221
Obese	0.236
No Education	0.137
Grade 1-7	0.246
Grade 8-11	0.400
Matriculation	0.134
Higher Education	0.082
Other Education	0.002
Membership of a Group (e.g. stokvel, sports group)	0.359
Married	0.278
Divorced/Widowed	0.110
Living Together	0.090
Never Married	0.523
Age (years)	37.364
Age-Squared	1703.542
Employed	0.380
Not Economically Active	0.429
Actively Searching for Work	0.123
Not Actively Searching for Work	0.065
Western Cape	0.109
Eastern Cape	0.136
Northern Cape	0.066
Free State	0.060
Kwazulu-Natal	0.271
North-West	0.093
Gauteng	0.101
Mpumalanga	0.068

Limpopo	0.098

Authors calculations based on NIDS (2008).

Table 4 Estimated Life Satisfaction Equations

Dependent Variable: Life Satisfaction (1= very dissatisfied, 10=very satisfied)	Model I		Model II		Model III		Model IV		Model V	
Variable Name	$\hat{\beta}$	t	$\hat{\beta}$	t	$\hat{\beta}$	t	$\hat{\beta}$	t	$\hat{\beta}$	t
Gini Coefficient	-0.281	-0.890	-0.679	-2.540	-0.631	-2.390	-0.649	-2.450	0.522	
Ethno-Linguistic Fractionalization	0.230	2.130	-0.004	-0.040					0.441	
Religious Fractionalization	-0.491	-3.260	-0.252	-1.710	-0.183	-1.240			-0.131	
Black-Ndebele* Ethno-Linguistic Fractional					0.545	1.170	0.536		0.522	1.330
Black-Xhosa* Ethno-Linguistic Fractional					0.471	1.440	0.471		0.441	1.340
Black-Zulu** Ethno-Linguistic Fractional					-0.117	-0.810	-0.123		-0.131	-0.950
Black-Sepedi* Ethno-Linguistic Fractional					-0.065	-0.250	-0.080		-0.117	-0.440
Black-Sesotho* Ethno-Linguistic Fractional					-0.135	-0.500	-0.145		-0.124	-0.460
Black-Setswana* Ethno-Linguistic Fractional					0.641	3.050	0.632		0.622	3.120
Black-Siswati* Ethno-Linguistic Fractional					-0.247	-1.040	-0.222		-0.138	-0.530
Black-Tshivenda* Ethno-Linguistic Fractional					-0.460	-0.840	-0.477		-0.559	-0.990
Black-Xitsonga* Ethno-Linguistic					0.030	0.060	0.046		0.072	0.150

Fractional					
Black-English or Afrikaans* Ethno-Linguistic Fractional	-0.103	-0.130	-0.137	-0.060	-0.070
Black-Other* Ethno-Linguistic Fractional	-1.320	-3.110	-1.303	-1.355	-3.230
Coloured--English or Afrikaans* Ethno-Linguistic Fractional	0.045	0.230	0.045	-0.006	-0.030
Coloured-Other* Ethno-Linguistic Fractional	0.320	0.330	0.289	0.464	0.390
Indian-English or Afrikaans* Ethno-Linguistic Fractional	-0.681	-4.200	-0.700	-0.683	-4.250
Indian-Other* Ethno-Linguistic Fractional	0.278	0.260	0.227	0.414	0.370
White-English or Afrikaans* Ethno-Linguistic Fractional	-0.886	-1.130	-1.020	-1.060	-1.340
White-Other* Ethno-Linguistic Fractional	3.215	2.930	3.034	2.981	2.670
Muslim* Religious Fractional			1.655	1.775	1.860
Jewish* Religious Fractional			-0.107	-0.496	-0.570
Hindu* Religious Fractional			0.988	0.956	1.210
Christian* Religious Fractional			-0.128	-0.124	-0.820
Traditional Religion* Religious Fractional			0.060	0.016	0.040
Other Religion* Religious Fractional			-0.801	-0.884	-2.340
No Religion* Religious Fractional			-0.965	-0.924	-2.850

Black-Ndebele	-0.214	-1.750	-0.605	-1.690	-0.603		-0.591	-1.990
Black-Xhosa	0.019	0.280	-0.212	-1.290	-0.213		-0.186	-1.120
Black-Sepedi	-0.084	-1.040	-0.107	-0.560	-0.096		-0.084	-0.440
Black-Sesotho	0.007	0.090	0.027	0.150	0.031		0.001	0.010
Black-Setswana	-0.137	-1.760	-0.478	-3.190	-0.474		-0.471	-3.310
Black-Siswati	0.164	1.750	0.195	1.340	0.178		0.139	0.940
Black-Tshivenda	-0.316	-1.590	-0.232	-0.760	-0.217		-0.210	-0.690
Black-Xitsonga	-0.003	-0.030	-0.079	-0.240	-0.085		-0.064	-0.200
Black-English or Afrikaans	-0.083	-0.620	-0.065	-0.120	-0.043		-0.081	-0.140
Black-Other	-0.026	-0.190	0.763	2.480	0.747		0.838	2.810
Coloured--English or Afrikaans	0.422	5.140	0.637	5.570	0.654		0.690	6.120
Coloured-Other	0.088	0.470	-0.123	-0.240	-0.095		-0.079	-0.150
Indian-English or Afrikaans	0.671	4.400	1.153	2.310	1.182		1.223	2.360
Indian-Other	-0.145	-0.390	-1.879	-2.790	-1.827		-1.806	-2.600
White-English or Afrikaans	0.322	3.630	0.272	1.710	0.275		0.297	1.860
White-Other	0.396	1.580	0.211	0.360	0.234		0.109	0.160
Jewish	0.173	1.160	0.168	1.130	0.159	0.410	0.361	0.990
Muslim	0.190	1.680	0.219	1.960	-0.613	-1.280	-0.701	-1.490
Hindu	0.079	0.410	0.074	0.380	-0.569	-1.160	-0.510	-1.050
Traditional Religion	-0.061	-1.030	-0.079	-1.330	-0.182	-0.950	-0.124	-0.640
Other Religion	0.259	4.350	0.255	4.210	0.574	3.010	0.647	3.410
No Religion	-0.106	-1.880	-0.104	-1.860	0.275	1.860	0.310	2.150

Log per capita household income		0.124	6.360	0.121	6.170	0.120	6.140	0.101	4.870
Log Average Income by cluster		0.046	1.230	0.057	1.500	0.059	1.570	0.049	1.300
Under-weight								-0.072	-2.710
Obese								0.015	0.520
Grade 1-7								0.137	3.570
Grade 8-11								0.226	5.440
Matriculation								0.247	4.850
Higher Education								0.281	4.760
Other Education								0.378	1.650
Member of a Group								0.137	4.850
Divorced/Widowed								-0.132	-3.840
Living Together								-0.116	-2.720
Never Married								-0.094	-2.730
Age								-0.028	-8.070
Age-Squared								0.000	7.490
Not Economically Active								-0.017	-0.560
Actively Searching for Work								-0.112	-3.000
Not Actively Searching for Work								-0.149	-3.150
Province	Yes		Yes		Yes		Yes		Yes
Observations	11,889		11,889		11,889		11,889		11,767
Log pseudolikelihood	-25684.949		-25378.3		-25333.187		-25321.276		-24925.493

Pseudo R2	0.021	0.033	0.035	0.035	0.040

Source: National Income Dynamics Study (NIDS) 2008

Note: The sample is all adults aged 15 years and older. The estimations control for the clustering of residuals across 400 household clusters. Reference groups are Zulu-speaking Blacks, Christians, of good weight, no education/schooling, married and employed.