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Women's optimism, the gender happiness equaliser: a case of South Africa

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Abstract

This paper investigates whether there is co-movement in subjective wellbeing (swb) gender gaps and objective wellbeing (owb) gender gaps over time and whether swb gender gaps are caused by gender differences in endowments or by the different ways men and women value the pre-mentioned. This is important, as global goals and national policy focus on the improvement of owb gender equality, ignoring the importance of swb gender equality. We use the NIDS dataset, comparing 2008 and 2017 data, and employ the Blinder-Oaxaca decomposition method in the analysis. We find i) the trends in owb- and swb gender gaps are unrelated and ii) the swb gender gaps are explained mainly by gender differences in endowments, but in 2017, due to women's "optimism", notwithstanding their lower levels of endowments, the swb between genders was equalised. These results indicate the need for a swb gender equality policy.

Keywords: Happiness gap; Gender; Blinder-Oaxaca decomposition; South Africa

JEL codes: I31; J16; D03

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1. Introduction

The norm is to measure gender equality using objective indicators of wellbeing, such as income, labour market participation, education and health. For example, looking at the sustainable development goals, *goal number 5, gender equality*, and the *Gender Inequality Index (GII)*¹ of the United Nations (United Nations Development Programme (UNDP, 2020) only objective indicators, to measure progress in gender equality, are used. Among the indicators are representation in parliament, land ownership and labour market presentation. However, wellbeing is not only measured using objective indicators of quality of life, but also subjective indicators of human flourishing (Stiglitz *et al.*, 2009), which relates to people's own evaluations of their lives (Haybron, 2013). Thus, to only measure objective wellbeing (owb) gender equality is one sided and implies that we ignore the own evaluations of life conditions.

¹ The GII uses three dimensions to measure the loss of achievement due to not having gender equality, namely: reproductive health, empowerment, and labour market participation

Subjective wellbeing (swb) gender equality is as important as owb gender equality, as any inequalities may have potential unwanted spill-over effects, which add to other disparities in society (Veenhoven, 2005). On the other hand, higher levels of swb gender equality can ease social tension with regard to i) social-capital problems, such as violence against women, ii) health-related problems such as substance abuse and stress-related illnesses, iii) human-capital problems such as early school dropouts and teenage pregnancies (Helliwell *et al.*, 2015), iv) increased job satisfaction and lower divorce rates, as there is an aversion to unequal sharing of wellbeing among couples (Guven, 2012).

As to achieve owb gender equality is a global goal and often a national goal, pursued by the implementation of policy measures and legislation, we expect that owb gender equality should improve over time. However, the question arises whether the same is true for swb gender equality, seeing that there are no specific policies or global goals to address this matter. Furthermore, it is important for policy purposes to know which characteristics/endowments contribute to the swb gender gaps and whether the gaps are due to gender differences in the observable characteristics or to differences in the way men and women value the observable characteristics and, lastly, whether the gender gaps and the explanation of these gaps vary over time.

Previous studies have determined that there are swb gender gaps in the majority of countries, with women in general being more satisfied with their lives than men (Blanchflower and Oswald, 2004; Graham and Chattopadhyay, 2013; Zweig, 2015), but in some instances the opposite was found. For example, research in South Africa has shown that the swb of men is higher than that of women (Blaauw and Pretorius, 2013; Ebrahim *et al.*, 2013; Posel and Casale, 2011).

A few studies have tracked the swb gender gap over time, for example Blanchflower and Oswald (2004) examined gender differences in swb in the UK and the USA. They reported that since the 1970's to late 1980's, the mean happiness levels in the USA declined over time, whereas they remained relatively constant in the UK. Furthermore, they found that over the same period, women in the USA were initially happier than men, but then this changed, with women's happiness decreasing notably to a point where they were less happy than men in the late 1980s. The decline in women's swb, was despite legislation aimed to reduce gender discrimination. In the UK, the levels of swb of women was more consistent and they were

happier than men for the period from the early 1970s to the late 1990s. Stevenson and Wolfers (2009), using data from the General Social Survey for 1972-2006, as well as the Eurobarometer for 1973-2002, found that the swb of American and European women, relative to men, declined over time, despite measures that were introduced to address owb gender gaps. Among other, an explanation offered for the decrease in the relative happiness of women is that the role of women in society has changed dramatically, offering challenges in many dimensions of life, increasing stress levels. Thus, women find the complexity and increased pressure of modern living to have come at the cost of happiness (Stevenson and Wolfers, 2009). A later study by Graham and Chattopadhyay (2013) used data from the Gallup World Poll (GWP) for 2005-2011 to examine gender differences in wellbeing around the world, and found results contradicting previous studies. Their results showed that, since 2005, women's swb is higher than that of men and when levels of wellbeing increase or decrease, the gap remains generally the same, with the exception of Sub-Saharan Africa, where men mostly have higher levels of happiness than women. In addition, they found that wellbeing levels are generally higher and the gender wellbeing gap greater in developed countries, compared to developing countries.

Only two studies, to the authors' knowledge, have decomposed the swb gender gap to determine whether observable differences in the characteristics, or the way men and women react to these observable characteristics, explain swb gender gaps. Arrosa and Gandelman (2016) decomposed the swb gender gap globally and at a national level, using the linear Blinder-Oaxaca (BO) method. Based on the results, the authors found firstly that, in contrast to Graham and Chattopadhyay (2013), the size of the gender happiness gap appeared to be larger in lower-income countries and smaller in higher-income countries. Furthermore, the observable characteristics did not explain the swb gender gap, which was rather explained by the unobserved (coefficient effect), thus the different ways in which men and women value these observable characteristics, with women seemingly valuing these factors more favourably than men. Boncompte and Paredes (2019) studied the gender happiness gap in Chile, a developing country which, relative to other developing countries, has a high level of swb (6.4 in 2018). They used the non-linear BO decomposition method. The authors found, a significant gender happiness gap favouring men, which could be fully explained by the differences in characteristics, such as income and education. This finding is similar to that of Graham and Chattopadhyay (2013) for Sub-Saharan African countries. In addition, they found evidence that men and women value the observable characteristics differently, especially if income and labour status are considered.

The current study contributes to the swb literature in the following ways: i) it adds to the very sparse literature on swb, which follows changes in the swb gender gap over time, and is one of the first studies that analyses swb gender gaps, relative to changes in owb gender gaps; ii) contributes to the literature that decomposes swb gender gaps, as it not only investigates the covariates that contribute to these gaps, but also the dynamics of the covariates over time; iii) is unique in that it analyses within-country swb gender gaps over time for a developing country that has very low levels of swb (4.7 in 2018) and suffers high inequalities, notwithstanding having one of the most progressive constitutions (The Republic of South Africa, 1996) and legislation that propagates equal human rights, and iv) in general contributes to a better understanding of the dynamics of swb gender gaps in lower-income, developing countries in Sub-Saharan Africa. These countries suffer from severe gender inequalities and are in dire need of development. The results of the current study can inform future policy, to address gender inequality, not only from an owb approach, but also from a swb approach.

In this paper we specifically refer to South Africa - a country that suffers from vast inequalities across various dimension, including income, race, space and gender (World Bank, 2018), notwithstanding its progressive constitution to protect equal human rights. This makes it an ideal choice for the study, as the high levels of inequalities offer us a better opportunity to observe changes over time. As mentioned South Africa is classified as a developing country and its human development index (HDI), which is a measure of development, has improved marginally over time from 0.664 in 2009 to 0.704 in 2017. If we only consider owb gender inequality, as measured by the *GII*, South Africa's owb inequality improved somewhat, from 0.424 in 2010 to 0.432 in 2017² (UNDP, 2019), but as mentioned previously, it does not reveal the state of affairs related to swb gender gaps.

To answer the main research question, we compare the swb and the owb gender gaps, at two points in time, namely 2008 and 2017, to determine the dynamics of these gaps. Furthermore, we decompose the swb gender gap in the two time periods, to i) determine which covariates contribute to the swb gender gaps and ii) to explain whether the changes in the gender gaps are due to gender differences in observable characteristics or the returns to said characteristics. We employ the National Income Dynamics Survey (NIDS) dataset, for the period 2008 and 2017

² United Nations Development Programme. (2019). *Human Development Report 2019*. Available at: <http://hdr.undp.org/en/content/table-5-gender-inequality-index-gii>.

in our empirical analysis, and use the linear BO decomposition method to decompose the swb gender gap.

The findings of this study show that in 2008 the swb of men was significantly higher than that of women, but over time the swb gender gap decreased to a point where, in 2017, there was no longer a statistically significant difference between the swb levels of genders. Over the same period of time, many of the owb gender gaps, such as the gaps in income, education and employment persisted or only improved marginally, even though global goals and national policy was directed at correcting these inequalities. The gender gap in 2008 was mainly explained by differences in observable characteristics, with the unobservable portion of the gap not being significant. In 2017, this situation changed, although the gap favouring men in observable characteristics persisted, women outperformed men in their ability to value these characteristics and increased their levels of swb, with this unexplained portion of the gap being significant and favouring women. Thus, the gap favouring men due to gender differences in characteristics in 2017 was offset by the unexplained portion of the gap (the “optimism” of women), resulting in no significant differences in the swb of genders.

The rest of this paper is structured as follows: Section 2 describes the methodology. Section 3 elaborates on the dataset used and the selection of variables. Section 4 provides the empirical results and section 5 concludes.

2. Methodology

To investigate whether the swb and owb gender gaps changed over time, we compare gender differences in the mean/median levels of swb and owb indicators at two points in time, 2008 and 2017. Furthermore, we test whether these differences between genders are statistically significant. To do so, we make use of the t-test in all instances but, as a robustness check, we also use the nonparametric k-sample test if the variables are ordered in nature, which considers the median of a variable rather than the mean. To derive the gender gaps in the indicators, we use the following equation:

$$gender\ gap = \overline{swb_m\ or\ X_m} - \overline{swb_f\ | X_f} \quad (1)$$

where *gender gap* is the difference between the self-reported *swb* variable or a vector of *observable characteristics* (X) (e.g. income, education and employment rates) of *males* (m) and *females* (f).

To compare the decomposition of the *swb* gender gaps in the two time periods, we make use of the BO³ decomposition method. The BO decomposition method is commonly used in studies to identify labour market discrimination by analysing the wage gap between two groups, for example, genders or races. The method decomposes the outcome differentials into a part that is *explained* by group differences in characteristics or endowments (endowment effect) and another part that is *unexplained* by such differences (coefficient effect). This unexplained part is often used as a measure of discrimination in the analysis of wage differentials. However, in *swb* literature we interpret it as the returns to the characteristics/endowments or the different ways in which men and women value these factors.

Seeing that our dependent variable, life satisfaction, is of an ordered nature on a scale from 1 to 10, the non-linear BO method, based on ordered probit estimations, is most appropriate to decompose the gap. However, the non-linear method has the following limitations: i) it does not allow for the estimation of the individual covariate contributions to the *swb* gender gap, or calculate the levels of significance of these differences; ii) it is not directly interpretable because the coefficients are derived from the ordered probit model, whereas the linear method does not have these limitations. Therefore, we estimate the non-linear and the linear BO decompositions and report the results of both, but then specifically refer to the linear BO results, when analysing the individual contributions to the gaps by the different covariates. Besides, there is strong evidence that the estimated coefficients using OLS and ordered probit estimation techniques are often very similar in sign and level of statistical significance, and therefore many scholars prefer to interpret the OLS estimates (Ferrer-i-Carbonell and Frijters, 2004).

As mentioned, the BO method is based on either OLS estimations (linear BO) or ordered probit estimations (non-linear BO) of the two compared groups (males and females). The standard *swb* equation given separately for males and females is as follows:

³ For detailed explanations of the BO method see Oaxaca (1973) and Blinder (1973).

$$swb_m = \beta_0 + \beta_m X_m + \varepsilon_m \quad (2)$$

$$swb_f = \beta_0 + \beta_f X_f + \varepsilon_f \quad (3)$$

where swb_m and swb_f are the self-reported swb of males and females, respectively; β_m and β_f are the parameters to be estimated in the male (equation 2) and female (equation 3) regressions; X_m and X_f are vectors of covariates, and ε_m and ε_f are the error terms.

The gender happiness gap is then calculated as the difference in mean outcomes between males and females:

$$\overline{swb}_m - \overline{swb}_f = (\bar{X}_m)\hat{\beta}_m - (\bar{X}_f)\hat{\beta}_f \quad (4)$$

where \overline{swb} represents the mean expected level of swb for males and females and is equal to the difference in the mean vector of parameters (\bar{X}) and the estimated returns ($\hat{\beta}$) for both groups. To decompose the swb gender gap into two components, we rewrite equation 4 as follows:

$$\overline{swb}_m - \overline{swb}_f = \underbrace{(\bar{X}_m - \bar{X}_f)' \hat{\beta}_m}_{\Delta X} + \underbrace{\bar{X}_f' (\hat{\beta}_m - \hat{\beta}_f)}_{\Delta \beta} \quad (5)$$

The first term to the right of the equals sign is considered to be the endowment effect (ΔX), while the second term is regarded as the coefficient effect ($\Delta \beta$).

3. Data and selection of variables

3.1 Data

The data we use for this study comes from the first and the fifth waves of the NIDS, collected in 2008 and 2017 (SALDRU, 2017). NIDS is a nationally representative longitudinal survey and follows individuals across waves - even if they move to different households or a different location within South Africa. These individuals are seen as Continuous Sample Members (CSM), although from wave 2 data is also collected for persons who are not CSMs but are co-resident with a CSM at the time of the survey. We refer to those as Temporary Sample Members

(TSM). A stratified, two-stage cluster sample design was employed for the sampling of households (SALDRU, 2008). Wave 1 of NIDS includes 40% males and 60% females (6 166 males and 9 144 females) and wave 5 includes 41% males and 59% females (9 756 males and 14 101 females).

3.2 Selection of variables

The dependent variable in the estimated functions is swb, which we measure by means of a question about life satisfaction. The question asks: “How do you feel about your life as a whole right now?” A response scale of 1 to 10 is used, where 1 means *very dissatisfied* and 10 means *very satisfied*.

The covariates are based on the standard variables found in the swb literature to explain swb. The variables relate to owb indicators such as income, education and employment status, as well as other socioeconomic and demographic variables such as: age, relative income, relative economic positioning, trust, race, relationship status, health, religion, electricity, toilet and geo-type (Blanchflower and Oswald 2004; Greyling, 2018; Helliwell, 2003; Posel and Casale 2011) (see table 6 in the Appendix for the coding of variables). Table 1 gives the descriptive statistics of the selected variables in 2008 and 2017, for the pooled sample and subsamples of males and females, respectively.

The expected relationship between the covariates and swb, based on previous findings, are as follows: Literature frequently reports a U-shaped relationship between age and happiness (Blanchflower and Oswald 2004, 2007). Therefore, we include both age and age-squared in our estimations, with those that are middle-aged having lower levels of happiness than the young and the old. Swb research consistently reveals that married people are happier than those who are single, divorced or widowed (Helliwell, 2003). The majority of the studies find a positive relationship between income and swb (Clark *et al.*, 2008). More recently, studies have begun to explore the role of relative income and relative economic positioning to explain an individual’s swb and find a positive correlation in most instances (Posel and Casale, 2011; Rojas, 2020). Several studies have examined the relationship between education and life satisfaction. However, the results are inconclusive, with some showing a positive relationship (Ilies *et al.*, 2019; Oswald and Powdthavee, 2008) and others finding no significant relationship (Helliwell, 2003). In general, religion is found to be significant and positively related to swb (Joshanloo and Weijers, 2016). According to South African literature, Africans have repeatedly

been found to have the lowest levels of reported swb compared to other race groups (Kollamparambil, 2019). The relationship between health and swb is inconsistent, especially in South African literature, though in some instances it is positive (Kollamparambil, 2019; Clark *et al.*, 2019) and in others not significant (Blaauw and Pretorius, 2013). Employment is generally believed to be a key determinant of swb, because it provides an income and fulfils various psychological needs (Blanchflower and Oswald, 2004; Helliwell, 2003). Lastly, research on swb has shown that there are geographical differences in happiness (Rentfrow, 2018). A number of studies show that urbanisation is negatively related to swb (Greyling and Rossouw, 2017; Mulcahy and Kollamparambil, 2016; Winters and Li, 2017).

Table 1: Descriptive statistics of the selected variables

	2008						2017					
	Pooled sample		Male		Female		Pooled sample		Male		Female	
	Mea n/ Freq	Std. Dev	Mea n/ Freq	Std. Dev	Mea n/ Freq	Std. Dev	Mea n/ Freq	Std. Dev	Mea n/ Freq	Std. Dev	Mea n/ Freq	Std. Dev
Variables												
Gender	1.00	0	0.40	0	0.60	0	1.00	0	0.41	0	0.59	0
Age	38	17.9	36	17.4	39	18.1	38	17.6	35	16.8	39	18.0
Income (log real)	2.03	1.13	2.18	1.17	1.93	1.10	2.44	1.08	2.60	1.11	2.34	1.05
Perceived income as average or above	0.46	0.50	0.48	0.50	0.45	0.50	0.57	0.50	0.58	0.49	0.56	0.50
Relative economic position perceived upper half	0.13	0.34	0.14	0.34	0.13	0.33	0.17	0.37	0.17	0.38	0.16	0.37
Trust	0.23	0.42	0.24	0.43	0.23	0.42	0.34	0.47	0.34	0.47	0.34	0.47
Race												
African	0.79	0.41	0.78	0.41	0.79	0.41	0.80	0.40	0.79	0.41	0.81	0.40
Mixed race	0.14	0.35	0.14	0.35	0.14	0.35	0.13	0.34	0.14	0.34	0.13	0.34
Asian/Indian	0.01	0.12	0.01	0.12	0.01	0.12	0.02	0.13	0.02	0.13	0.02	0.12
White	0.06	0.23	0.07	0.25	0.05	0.23	0.05	0.22	0.05	0.23	0.05	0.21
In relationship	0.37	0.48	0.40	0.49	0.35	0.48	0.32	0.47	0.34	0.47	0.31	0.46
Health status												
Poor health	0.08	0.27	0.07	0.25	0.09	0.29	0.03	0.16	0.02	0.14	0.03	0.18
Fair health	0.13	0.34	0.11	0.31	0.15	0.36	0.09	0.28	0.07	0.26	0.10	0.30
Good health	0.24	0.43	0.22	0.41	0.26	0.44	0.27	0.44	0.25	0.43	0.29	0.45
Very good health	0.25	0.43	0.27	0.44	0.24	0.43	0.31	0.46	0.32	0.47	0.31	0.46
Excellent health	0.29	0.45	0.34	0.47	0.26	0.44	0.30	0.46	0.34	0.48	0.28	0.45
Educational attainment												
Primary education	0.39	0.49	0.41	0.49	0.38	0.48	0.29	0.46	0.31	0.46	0.29	0.45
Secondary education	0.37	0.48	0.36	0.48	0.38	0.48	0.43	0.49	0.43	0.49	0.43	0.49
Tertiary education	0.05	0.23	0.05	0.22	0.06	0.23	0.09	0.29	0.09	0.28	0.10	0.30

Employment status												
Not economically active	0.43	0.50	0.37	0.48	0.47	0.50	0.49	0.50	0.42	0.49	0.54	0.50
Unemployed	0.18	0.39	0.15	0.35	0.21	0.40	0.13	0.34	0.12	0.33	0.13	0.34
Employed	0.39	0.49	0.48	0.50	0.33	0.47	0.38	0.49	0.46	0.50	0.33	0.47
Religious	0.88	0.32	0.82	0.38	0.93	0.26	0.90	0.30	0.84	0.36	0.94	0.24
Electricity	0.78	0.42	0.79	0.41	0.77	0.42	0.88	0.33	0.88	0.33	0.88	0.33
Toilet	0.47	0.50	0.49	0.50	0.45	0.50	0.52	0.50	0.54	0.50	0.50	0.50
Urban	0.49	0.50	0.51	0.50	0.48	0.50	0.54	0.50	0.56	0.50	0.52	0.50

Source: Author's calculations using NIDS Wave 1 and Wave 5

From the descriptive statistics, we see that gender differences seem to emerge across a number of variables. In 2008, we find that men are i) more likely to be employed (48% compared to 33% women), ii) the majority, 34%, rank their perceived health status as excellent compared to only 26% of the women, and iii) they receive an average income of 15% more than women. In the same period, women are i) more likely to be not economically active (NEA), and ii) attach greater importance to religion than males. In 2017 these differences between the genders are slightly smaller. However, males continue to be advantaged in that they are more likely to be employed, 34% rank their perceived health status as excellent, compared to only 28% of the females, and their income levels are 11% higher than those of their female counterparts.

4. Results

4.1. A comparison of the swb and owb gender gaps in 2008 and 2017

If we consider our selected objective measures of the gender gaps (income, years of education and labour participation rate) for 2008 and 2017, we find that in some instances the gaps decreased, for example labour participation rates, but in other instances they have increased, for example income (logged) and education. Turning to swb, we find that the gender gap decreased from 2008 to 2017.

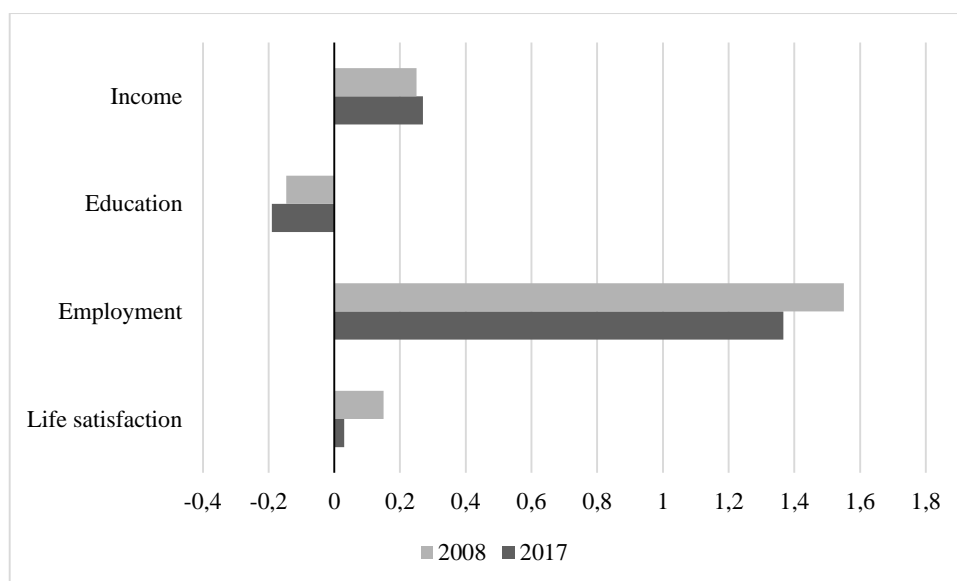


Figure 1: Gender gaps in objective and subjective measures, 2008 and 2017

Source: Author's calculations using NIDS Wave 1 and Wave 5

*Employment shows the differences in the ratios of employed genders as $x/100$, to make the scales comparable

Table 2 indicates the gender gaps, the t-statistics and the chi-square statistics resulting from the nonparametric k-sample tests for 2008 and 2017. The mean gap in the years of education increased favouring females from 0.15 ($p=0.00$) in 2008 to 0.19 ($p=0.00$) in 2017. Showing that on average females have higher levels of schooling than males. However, a more detailed analysis shows that the percentage of females that have no schooling is higher than that of males. Comparing each year of schooling from Grade 0, a higher percentage of males achieved lower levels of schooling, but from grade 10 this switches around, favouring females. Grade 9 is the level when children are legally allowed to exit the schooling system. From a policy point of view all children should be enrolled in school and, to achieve gender equality, the emphasis should be on female enrolment. Furthermore, males should be encouraged to stay in school and not exit in Grade 9.

The gap in income increased in favour of males from 0.25 ($p=0.00$) in 2008 (R185.45 or \$12.65⁴) to 0.27 in 2017 ($p=0.00$) (R525.11 or \$35.82) and the gap, considering those that are employed, favoured men, decreasing negligibly with 2% over the whole period and remaining substantial at 14% in 2017. We notice that, notwithstanding a progressive constitution and legislation to address owb gender equality, the gender gaps in objective indicators only marginally changed, with certain gaps, such as in income and education, increasing rather than

⁴ Calculated using today's dollar/rand exchange rate of R14.66/\$

decreasing, and in labour participation only changing marginally. This implies that not much progress towards owb gender equality was made in the almost ten years under analysis. These results make the suitability of the current policies and legislation questionable.

Table 2: Test statistics for gender differences in means/medians, 2008 and 2017

	Gender Gaps (Male – Female)		T-stat (Differences in means)		Chi-square (Differences in medians)	
	2008	2017	2008	2017	2008	2017
Income	0.25	0.27	-10.08 (0.00)	-12.97 (0.00)	-	-
Education	-0.15	-0.19	3.21 (0.00)	2.92 (0.00)	11.61 (0.00)	12.22 (0.00)
Employment	15.51	13.67	-16.98 (0.00)	-23.82 (0.00)	241.77 (0.00)	492.15 (0.00)
Life satisfaction	0.15	0.03	-3.88 (0.00)	-0.85 (0.39)	21.56 (0.00)	0.58 (0.45)

Note: P-values in parentheses

Turning to swb gender equality, the mean life satisfaction of males was 5.5 in 2008, whereas that of females was 5.38, representing a gender gap of 0.15 (figure 1). This difference is statistically significant with $p=0.00$ (table 2). The finding of men being happier than women is in line with Graham and Chattopadhyay (2013) for Sub-Saharan African countries. In 2017, the swb gender gap decreased to only 0.03 (mean males=5.59 and females=5.56) (figure 1), with the difference no longer statistically significant ($p=0.39$) (table 2). Thus, we can confirm that the gender gap in swb decreased from 2008 to 2017, despite the fact that the gender gaps in the selected objective measures of wellbeing either increased or only improved marginally.

These results highlight the differences in the trends of owb and swb gender gaps. In the next sections, we will explain the likely reasons for the decrease in the swb gender gap, even though owb gender gaps persisted or only decreased marginally. This finding indicates that policy measures, other than those that address owb gender gaps, should be considered.

3.2 OLS and ordered probit results of the estimated swb functions in 2008 and 2017

To address the second research question, we start off by reporting the OLS and ordered probit results of the estimated swb functions for the two time periods, 2008 and 2017 (table 3). We find that the gender variable (Male=1) is positive and significant in 2008, but not in 2017, indicating that the mean swb of men was significantly higher than that of women in 2008, however in 2017, there is no longer a significant difference between genders. This result is in

line with the previous results using t-tests (table 2), but it is more robust as it controls for other covariates of swb.

Table 3: OLS and ordered probit results: SWB regressed on the standard covariates of swb

	2008		2017	
	OLS	Ordered probit	OLS	Ordered probit
	Pooled sample	Pooled sample	Pooled sample	Pooled sample
Gender (Male=1)	0.12*** (0.04)	.06*** (0.02)	0.01 (0.03)	0.00 (0.01)
Age	-0.03*** (0.01)	-0.02*** (0.00)	-0.04*** (0.01)	-0.02*** (0.00)
Age ² /100	0.04*** (0.00)	0.02*** (0.00)	0.05*** (0.00)	0.02*** (0.00)
Income (log)	0.11*** (0.02)	0.05*** (0.01)	0.19*** (0.02)	0.08*** (0.01)
Relative income	0.89*** (0.04)	0.45*** (0.02)	0.48*** (0.03)	0.22*** (0.01)
Rel. eco. position	0.76*** (0.06)	0.36*** (0.03)	0.74*** (0.04)	0.32*** (0.02)
Trust	0.32*** (0.05)	0.15*** (0.02)	-0.16*** (0.03)	-0.07*** (0.01)
Mixed race	0.97*** (0.06)	0.47*** (0.03)	0.71*** (0.05)	0.31*** (0.02)
Asian/Indian	0.63*** (0.13)	0.30*** (0.06)	0.00 (0.10)	0.00 (0.04)
White	0.63*** (0.08)	0.29*** (0.04)	0.63*** (0.07)	0.26*** (0.03)
In relationship	0.12*** (0.04)	0.06*** (0.02)	0.31*** (0.04)	0.13*** (0.02)
Fair health	0.34*** (0.08)	0.17*** (0.04)	0.15 (0.12)	0.09* (0.05)
Good health	0.44*** (0.08)	0.23*** (0.04)	0.42*** (0.11)	0.21*** (0.05)
Very good health	0.78*** (0.08)	0.39*** (0.04)	0.67*** (0.11)	0.32*** (0.05)
Excellent health	0.66*** (0.08)	0.33*** (0.04)	0.68*** (0.11)	0.33*** (0.05)
Primary education	0.21*** (0.06)	0.10*** (0.03)	0.04 (0.07)	0.02 (0.03)
Secondary education	0.23*** (0.07)	0.11*** (0.03)	0.01 (0.07)	0.01 (0.03)
Tertiary education	0.27** (0.13)	0.12* (0.06)	0.13 (0.11)	0.07 (0.05)
Unemployed	-0.26*** (0.06)	-0.13** (0.03)	0.01 (0.05)	0.01 (0.02)
Employed	-0.07 (0.05)	-0.03 (0.02)	0.05 (0.04)	0.02 (0.02)
Religious	0.32*** (0.06)	0.16*** (0.03)	0.60*** (0.05)	0.26*** (0.02)
Electricity	0.22*** (0.05)	0.11*** (0.02)	-0.06 (0.05)	-0.03 (0.02)
Toilet	0.34*** (0.06)	0.17*** (0.03)	0.19*** (0.05)	0.08*** (0.02)
Urban	-0.03 (0.05)	-0.02 (0.03)	-0.11** (0.05)	-0.04** (0.02)
Constant	3.69*** (0.16)	-	4.22*** (0.17)	-
/cut1	-	-0.83*** (0.08)	-	-1.14*** (0.08)
/cut2	-	-0.52*** (0.08)	-	-0.64*** (0.08)
/cut3	-	-0.12 (0.08)	-	-0.22*** (0.08)
/cut4	-	0.32*** (0.08)	-	0.19*** (0.08)
/cut5	-	1.10*** (0.08)	-	0.67*** (0.08)
/cut6	-	1.47*** (0.08)	-	1.03*** (0.08)
/cut7	-	1.86*** (0.08)	-	1.40*** (0.08)
/cut8	-	2.27*** (0.08)	-	1.79*** (0.08)
/cut9	-	2.45*** (0.08)	-	1.99*** (0.08)

Observations	14002	14002	23794	23794
Durbin-Wu-Hausman p-value	0.290		0.321	
R ² /Pseudo R ²	0.195	0.051	0.096	0.023
Prob>chi2	0.000	0.000	0.000	0.000

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculations using NIDS Wave 1 and Wave 5

Table 3 shows that the covariates mostly have the expected signs and levels of significance in both the OLS and ordered probit models in 2008 and 2017, similar to that found in the swb literature (see section on selection of variables), with the exception of the following:

To trust your neighbour was significant and positively related to swb in 2008, but the sign changed to negative in 2017. This is unexpected and somewhat surprising as it suggests that higher levels of trust are associated with lower levels of life satisfaction. This is likely the result of a combination of events that occurred over the years, causing South Africans to become distrustful of others, possibly as a result of crime, corruption and xenophobia, as well as economic and political uncertainty.

Having any level of education rather than having no education was statistically significant and positive in 2008, but interestingly no longer significant in 2017. This implies that in 2017, any level of education compared to having no education is not related to swb. This finding is consistent with a number of recent South African studies by Greyling (2018), Posel and Casale (2015), however it differs from other studies which have found a positive relationship between education and swb (Kollamparambil, 2019; Powdthavee, 2003). As a result of these contradicting findings, it appears that the relationship between educational attainment and swb in South Africa is still contested.

To be employed rather than being NEA is not significant in either 2008 or 2017. This contradicts swb literature, which shows a significant and positive relationship (Greyling, 2018). In addition, being unemployed rather than being NEA is significant and negatively related to swb in 2008 as is expected, but in 2017 it is no longer significant. This is an interesting finding which suggests that unemployment is no longer a significant predictor of the life satisfaction of males and females. Despite not knowing the exact cause or reason for this change, we believe that this may be a reflection of the reality of millions of people in South Africa who have been unemployed for so long, that they no longer view unemployment as a factor in determining

their own happiness and have subsequently lost all hope in finding future employment. In 2008, the level of swb was not significantly related to the geographical area, though in 2017 this changed, with those in rural areas being more satisfied with life than those in urban areas. Mulcahy and Kollamparambil (2016) argue that this change is as a result of “false expectations and the emotional costs of being away from family and a home environment.” Electricity, although positive and significant in 2008, is no longer significant in 2017. The loss of significance is likely a reflection of the highly disruptive load-shedding episodes that began in 2008 and came at an enormous cost to many households and the economy as a whole, but due to adaptation was no longer significant in 2017.

To address the second research question, we use these covariates to decompose the gender happiness gap in the two time periods, and to compare the results in the two periods.

3.3 Blinder-Oaxaca decomposition results

Table 4 presents the results of the BO decomposition model (as defined by equation 5), with males being the reference group because they are assumed to have higher levels of swb in South Africa.

Table 4: Blinder-Oaxaca decomposition results, 2008 and 2017

	2008				2017			
Gap ($\overline{swb}_m - \overline{swb}_f$)	0.154***				0.026			
	Explained	%	Unexplained	%	Explained	%	Unexplained	%
Linear regression	0.12***	78	0.03	22	0.09***	350	-0.07**	-250
Ordered probit ⁵	0.11	68	0.05	32	0.08	310	-0.06	-210

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculations using NIDS Wave 1 and Wave 5

In 2008, the difference in swb between males and females is positive and statistically significant. This implies that males experience significantly higher levels of swb compared to females, consistent with our previous results (table 2). The explained component is positive and statistically significant, its percentage contribution to the gender happiness gap being substantially larger than the unexplained component (78% and 22%, respectively). This means

⁵ Ordered probit Blinder-Oaxaca results do not provide the statistical significance of the explained and unexplained components.

that in 2008, the gender happiness gap favouring males was driven primarily by the difference in observed characteristics between the two genders, which is in line with the finding of Boncompte and Paredes (2019) in Chile.

In 2017, the gender happiness gap is no longer statistically significant, consistent with our previous findings (table 2). The positive and significant sign of the explained component suggests that males continued to be in a favourable position with higher levels of observable characteristics and endowments. The question now arises, how is it possible that the gender happiness gap is not significant in 2017, in light of men still being advantaged in terms of their observed characteristics. The answer lies in the unexplained component being negative and statistically significant, thus favouring females. This offsets the positive explained component, so that the total gap is no longer significant. This implies that women value observable characteristics more than men do, and thus attain higher levels of swb returns. In this way, over time, women adapted to the many roles they play in the society, as part of the job market, care takers of children and home makers. On the contrary, men's happiness is significantly related to their economic position. Unlike women, their economic position is not ideal, their swb returns decrease. A possible explanation for women's outperforming of men, regarding their valuing of objective characteristics, might be the importance they place on their religious beliefs, as a key source of their happiness. Research has shown that more religious people enjoy higher levels of happiness (Joshanloo and Weijers, 2016).

Table 5 shows the detailed decomposition results of the individual covariates for the explained and unexplained components of the swb gender gap in 2008 and 2017. To determine which covariates contributed to the gender gaps and how this changed over time, we compare the individual contribution of the covariates of i) the explained component and ii) the unexplained component in the two time periods.

Table 1: Proportional contribution of variables to the gender happiness gap, 2008 and 2017

	2008		2017	
	Explained	Unexplained	Explained	Unexplained
Age	0.09*** (0.02)	-0.09 (0.47)	0.17*** (0.02)	-1.05*** (0.40)
<i>Age</i> ²	-0.09*** (0.019)	0.04 (0.23)	-0.16*** (0.02)	0.49** (0.20)
Income (log)	0.03*** (0.01)	0.01 (0.10)	0.05*** (0.01)	0.10 (0.10)
Relative income	0.03*** (0.01)	-0.02 (0.04)	0.01*** (0.00)	0.04 (0.04)
Rel. eco. position	0.01* (0.00)	0.01 (0.02)	0.01*** (0.00)	-0.08* (0.01)

Trust	0.01** (0.00)	-0.04* (0.02)	-0.00 (0.00)	0.034 (0.02)
Mixed race	0.00 (0.01)	-0.02 (0.02)	0.00 (0.00)	-0.01 (0.01)
Asian/Indian	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
White	0.01*** (0.00)	-0.01 (0.01)	0.00** (0.00)	0.00 (0.00)
In relationship	0.01** (0.00)	-0.02 (0.04)	0.01*** (0.00)	0.00 (0.03)
Fair health	-0.01*** (0.00)	-0.02 (0.02)	-0.00 (0.00)	-0.00 (0.02)
Good health	-0.02*** (0.00)	-0.05 (0.04)	-0.02*** (0.00)	0.03 (0.06)
Very good health	0.02** (0.01)	0.00 (0.04)	0.01* (0.00)	0.012 (0.08)
Excellent health	0.06*** (0.01)	-0.00 (0.05)	0.05*** (0.01)	0.04 (0.08)
Education years	0.01** (0.00)	-0.07 (0.10)	0.00 (0.00)	-0.00 (0.11)
Unemployed	0.02*** (0.00)	0.02 (0.02)	-0.00 (0.00)	-0.00 (0.01)
Employed	-0.01 (0.01)	0.03 (0.04)	0.00 (0.00)	0.01 (0.03)
Religious	-0.04*** (0.01)	-0.16 (0.10)	-0.05*** (0.00)	-0.01 (0.10)
Electricity	0.01*** (0.00)	0.041 (0.08)	-0.00 (0.00)	-0.03 (0.08)
Toilet	0.01*** (0.00)	-0.03 (0.06)	0.01*** (0.00)	-0.03 (0.05)
Urban	-0.00 (0.00)	-0.03 (0.05)	-0.00** (0.00)	0.026 (0.05)
Constant		0.43 (0.32)		0.32 (0.34)
Observations	14002	14002	23771	23771

Source: Author's calculations using NIDS Wave 1 and Wave 5

Considering the explained portion of the swb gender gaps, the following gender differences in the covariates were significant in 2008, but not in 2017: trusting your neighbour, having a fair level of health, secondary levels of education, unemployment and access to electricity. These gaps in observable characteristics had disappeared over time. This proves that policy measures that were introduced to address these observable gender gaps, were successful. However, policy was less successful in addressing the gender gaps in the following covariates. Although, there are no significant differences in the category *fair levels of health* between genders, there are differences in the categories *good or excellent health*. From a policy point of view, healthcare for women should be improved so that the majority can, similar to their male counterparts, have health levels in the categories of *good or excellent health*. Another example is education: the results of the BO decomposition, using mean years of education, show that the gender gap, favouring women, is significant and persisted in the two time periods. Similar to our previous explanation, the persisting gap, might be explained by males continuing to leave the school system at an earlier age than females.

The gaps which persisted and which favour men are: age, income, relative income, economic position, having levels of good health or excellent health and having access to a toilet. These differences in the observable characteristics are responsible for the explained component of the

gender gap, which remained significant in 2017. It is these factors that should be addressed by policy to improve owb gender equality. One of the main findings of this section is that the majority of the gender gap in observable characteristics are related to economic factors, including income, relative income and economic position. These results show that females are still economically disadvantaged in South Africa and that policy should be developed, implemented and enforced to give women equal economic standing to men. This should be a policy priority, to improve the economic power of women, not only from a gender equality perspective, but also from a development perspective (UN Women, 2018). Religion is statistically significant and favours women in both time periods. The fact that females are more religious than males, likely contributes to women's ability to gain higher swb returns from their observable characteristics (Joshani and Weijers, 2016).

Turning to the unexplained portion of the gender gaps, we find that it was not significant in 2008, implying that both genders had similar abilities to generate swb returns from the observed characteristics. However, this changed in 2017, with females outperforming males and achieving greater returns from their observable characteristics, especially from their relative economic position. Thus, if females feel that they are economically relatively better-off than other people in their neighbourhood, they attain a higher swb return from that than males. This once again shows that improved economic positions for females can increase their swb significantly.

To summarise, even if there are owb gender gaps and these gaps persist over time, we should also consider the differences in the way males and females value observable characteristics, such as employment opportunities and income, since females seem to be more “optimistic” than males and tend to value objective characteristics more positively in their lives.

4. Conclusion

Gender equality is a main international goal (sustainable development goal number 5) and also often among the main national policy priorities. These goals and policies are directed at objective indicators of gender equality, such as income, employment and education. However, subjective gender equality is just as important as owb gender equality, as gender inequalities in swb may have unwanted spill-over effects, such as higher levels of social tension, violence

against women, higher divorce rates, substance abuse, and stress-related illnesses (Guven, 2012; Helliwell *et al.*, 2015).

We assume that policy directed at decreasing owb gender gaps has positive outcomes, though it does not necessarily address swb gender gaps. Therefore, in this paper, we compare swb and owb gender gaps, at two points in time, namely 2008 and 2017, to determine whether the dynamics of these gaps are similar. Furthermore, we decompose the swb gender gap in the two time periods, i) to determine which covariates contribute to the swb gender gaps; and ii) to explain whether the changes in the gender gaps are due to gender differences in observable characteristics or the returns to said characteristics. We employ a nationally representative dataset of South Africa, NIDS, and use the BO decomposition method to decompose the swb gender gap in both time periods. If the trends in swb and owb gaps are unrelated, it implies a need for a policy that specifically addresses swb gender gaps. These future policy measures should be informed by the results of the BO decomposition, thus the explanations of the gaps, namely whether the gaps are due to gender differences in observable characteristics or returns to the said characteristics.

The current study contributes to the swb literature by adding to the very sparse literature, which follows changes in the swb gender gap over time, and is one of the first studies that compares it to owb gender equality and relates the gaps to policy measures. Furthermore, it is one of the first studies that analyses and attempts to explain the reasons for swb gender gaps over time, with the purpose of informing policy. The study is also unique in that it analyses a developing country in Sub-Saharan Africa, which suffers from great inequalities and has very low levels of happiness (South Africa). Lessons learned from this study can be applied to countries with similar characteristics.

The results show that the changes in the gender gaps over time vary, when comparing objective indicators with a subjective indicator of wellbeing. Objective gender gaps, notwithstanding policy directed at decreasing the gaps, either increased (income), or showed negligible improvements (education and employment rates). The swb gender gap decreased, even though the observable gender differences in characteristics persisted over time. The decrease in the swb gender gap can be explained by the “optimism” of women, gaining higher swb returns from the mentioned characteristics and endowments than men. Following Arrosa and Gandelman (2016), we view the concept “optimism” in a very broad way, indicating, that with

the levels of observable characteristics females have, they are happier than what we expect them to be. We refer to this concept as “*female optimism*”.

These findings indicate that owb gender gaps and swb gender gaps are significantly different from one another, not only in terms of the indicators used to measure these gaps, but also considering the trends over time. Therefore, specific policy addressing swb gender gaps is a necessity at global and national levels. It is important to realise that, when analysing swb gender gaps, not only observable characteristics are at play, but also unobservable factors such as the adaptation of genders to changed circumstances, which might improve their ability to value observable characteristics and endowments. These unobservable characteristics are of the utmost importance and should be valued and nurtured as similar to the “optimism” of women that equalised the gender happiness gap in 2017. In the current study, they can contribute to optimising swb returns in a nation. Future studies should attempt to identify and better understand these unobservable factors.

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6. Appendix

Table 6: Description of variables used

Variable name	Type	Description
Dependent Variable:		
SWB	Ordinal	Respondent's self-reported level of life satisfaction
Covariates:		
Age	Continuous	Age of respondent in years
Age ²	Continuous	Age-squared
Income (log)	Continuous	Log of real monthly household income per capita
Relative income	Dummy	1=Respondent classifies their income as average or above average, 0=Otherwise
Relative economic position	Dummy	1=Respondent's relative economic position is perceived to be upper half, 0=Otherwise
Trust	Dummy	1=Respondent trusts neighbours, 0=Otherwise
Race	Categorical	1=Respondent is mixed race, 2=Respondent is Asian/Indian, 3=Respondent is White, 0=Otherwise
Relationship status	Dummy	1=Respondent is in a relationship, 0=Otherwise
Health status	Categorical	1=Respondent's health is perceived to be fair, 2=Respondent's health is perceived to be good, 3=Respondent's health is perceived to be very good, 4=Respondent's health is perceived to be excellent, 0=Otherwise
Educational attainment	Categorical	1=Respondent has primary education, 2=Respondent has secondary education, 3=Respondent has tertiary education or above, 0=Otherwise
Employment status	Categorical	1=Respondent is unemployed, 2=Respondent is employed, 0=Otherwise
Religious	Dummy	1=Respondent is religious, 0=Otherwise
Electricity	Dummy	1=Household has electricity, 0=Otherwise
Toilet	Dummy	1=Household has flushing toilet, 0=Otherwise
Urban	Dummy	1=Household resides in urban area, 0=Otherwise