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Smoking and Subjective Well-being in South Africa

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Abstract

The effect of smoking cigarettes on measures of subjective well-being such as life satisfaction is gaining momentum despite the fact that it received less scholarly attention, especially in Southern Africa. Given the potential health and social effects of cigarette smoking, policymakers around the world are debating on whether tobacco control measures should be strengthened based on well-being of cigarette smokers. Applying an ordered logit regression model to Wave 5 cross-sectional data from the 2017 National Income Dynamics Study (NIDS) for South Africa, the paper examined the effect of smoking cigarettes on the life satisfaction of cigarette smokers in South Africa. The main finding of the paper is that cigarette smokers are less likely to report high levels of life satisfaction compared to non-smokers. Thus, based on the adult sample used, non-smokers experience more life satisfaction than cigarette smokers in South Africa. Therefore, programs aimed at helping smokers to overcome their addiction such as cessation therapies and pre-emptive education are recommended as policy responses.

Keywords: *Life satisfaction; Subjective Well-being; tobacco control; cigarette smokers*

Introduction

[1] indicated that the tobacco industry contributed $770 billion to the global economy in 2016. This shows that tobacco smoking is an important phenomenon despite its adverse effects on environmental and health outcomes. Policymakers and researchers around the world are debating on whether tobacco control measures should be strengthened given the potential health and social effects of cigarette smoking [2]. On one hand, [3] argued that tobacco control measures are relevant, especially in developing countries where poor people resort to addictive substances like nicotine in times of economic crisis. On the other hand, [4] argues that tobacco use control should be less aggressive since it impacts domestic resource mobilization by stifling collections from excise tax and revenue from tobacco sales in developing countries.

As part of tobacco control policies, in 1993 South Africa placed a ban on the sale of cigarettes to minors

and made it mandatory that health warnings be printed on packages of cigarettes. In addition, smoking cigarettes in indoor public places and advertising cigarettes on broad media was abolished [5]. The excise tax on cigarettes as a primary tobacco smoking deterrent in South Africa increased from 21% to 50% of the price of cigarettes between 1994 and 1997 [6]. Reducing tobacco smoking gained support from public health officials and health economists who argues that cigarette smoking exposes people to respiratory diseases [7]. According to [8] individuals derive disutility from poor health status and utility from at least good health. Hence, smoking reduces life satisfaction, especially for individuals whose stock of health is reduced by cigarette smoking. Therefore, the purpose of this paper is to investigate the impact of cigarette smoking on life satisfaction or subjective well-being.

The paper attempts to answer the following research question: Do non-smokers experience more life satisfaction than cigarette smokers?

This paper is motivated by the desire to check whether tobacco smoking control can be justified on the perspective of the well-being of tobacco smokers. Taxation has long been the primary tool for tobacco control in South Africa; however, the psychological effects of cigarette smoking are not considered when selecting tobacco control tools. Hence, the results of the paper provide insight into whether standard tobacco control policies can be generic or specific given the effect of cigarette smoking and reported life satisfaction. If there exists a significant negative relationship between cigarette smoking and reported life satisfaction, then programs aimed at helping smokers to overcome their addiction and reduce smoking incidence are recommended as policy responses.

Various studies were carried out on the relationship between subjective well-being and smoking with the objective of equipping policymakers with evidence on the empirical relationship between the two variables. Empirical evidence helps policymakers when it comes to evidence based decision making especially when crafting policies aimed at improving the well-being of individuals. According to [9] objective well-being and subjective well-being are highly correlated, so subjective well-being is a very useful complementary measure of well-being.

Using telephone surveys of Chinese adults living in Hong Kong, [7] investigated subjective well-being and cigarette smoking. A logistic regression was applied to the survey data with 4553 participants collected between 2009 and 2012. The authors found that non-smokers and ex-smokers reported high levels of subjective well-being than smokers. In addition, the results also indicated that those individuals who managed to quit smoking reported an increase in subjective well-being levels while those who attempted to quit smoking but failed experienced a temporary drop in well-being.

Using per capita cigarette consumption macroeconomic data for five developed countries[1], [10] applied the bootstrap test for causality in an assessment of the relationship between subjective well-being and cigarette smoking. In France, Britain, and Japan there was a unidirectional causality from subjective well-

[1] The United States; Japan; Britain; France and Germany

being to smoking. This indicates that when people are less happy, they resort to smoking. In addition, the study revealed that regular smokers tend to smoke less when they feel happy. However, one of the limitations of the study is that the study did not consider the well-being of individual smokers after quitting.

[11] investigated the correlation between nicotine dependence and mindfulness in Brazil applying techniques such as two-way ANOVA and bi-serial correlation for distributions which are not normal. The authors also used the Fagerström Test for Nicotine Dependence and the global subjective well-being scale for 181 respondents. The findings of the study revealed that current smokers are less mindful of their feelings and they experience less happiness than non-smokers. The findings also shows that smoking negatively affects an individual's well-being.

[12] explored the relationship between cigarette smoking and subjective well-being of individuals in Netherlands using Longitudinal Internet Studies for the Social Sciences (LISS) survey dataset with above 5000 respondents. The main objective of the study was to check if the subjective well-being of ex-smokers improved over time. The findings of the study showed that individuals who voluntarily quit smoking and those who quit as a result of strict regulation have no significant differences in terms of their subjective well-being.

In South Africa, [6] analyzed Smoking and Subjective wellbeing in South Africa using ordinal logistic regression model. The author used Wave 1 to Wave 4 National Income Dynamics Study (NIDS) study dataset collected in 2008, 2010, 2012 and 2014 for South Africa as four distinct cross sections. The results of the study indicated that smokers of cigarette are less likely to report high levels of life satisfaction than non-smokers. The study could have been much more informative if the dataset would have been used as panel as opposed to distinct cross sections.

[7] pointed out that it is difficult to ascertain the temporal sequence in an investigation of the relationship between subjective well-being and cigarette smoking since a bi-directional causality may exist between these two variables. Hence, there might be a simultaneity problem where individuals with low life satisfaction may take up smoking or individuals whose life satisfaction increasingly find the will power to stop smoking. Thus, addressing endogeneity emanating from bi-directional causality between the two variables is important. According to [13] a panel data model which eliminates time invariant heterogeneity and exploits changes within the same cross-sectional units over time is useful in reducing the risk of confounding. [14] proposed the first-deference model which helps with determining order of causality and it relaxes the assumption of strict exogeneity (required when dealing with reverse causality). In addition, use of instrumental variables approach can deal with bi-directional causality when one is using cross-sectional data. In this paper, an instrumental variable approach is an appropriate way of dealing with this problem since the data available here is cross-sectional. However, the approach was not applied because the NIDS data do not allow for this as there are no appropriate instruments available for

either smoking status or life satisfaction.

Materials and Methods

The paper is guided by [6] who analyzed Smoking and Subjective wellbeing in South Africa using ordinal logistic regression model. This is supported by [15] who alluded that when one assumes life satisfaction to be interpersonally ordinal, use of an ordered Probit/logit model is appropriate. This paper applied an ordered logit regression model on Wave 5 dataset of the NIDS study since there is a definite ordering of responses on reported "Life satisfaction" (dependent variable) with high values reported on the life satisfaction scale representing high levels of well-being.

Following [16] an ordered logit model can be specified as:

$$\boldsymbol{y_i^* = X_i'\beta + \mu_i} \quad \ldots\ldots (1)$$

where $\boldsymbol{y_i^*}$ latent variable for life satisfaction, $\boldsymbol{X_i'}$ is a vector of all explanatory variables, $\boldsymbol{\beta}$ vector of parameters and $\boldsymbol{\mu_i}$ is the error term. Since encoding of variable $\boldsymbol{y_i^*}$ has been reduced to 1, 2,…, 5, then:

$$y_i = \begin{cases} 1 \; if \; y_i^* \leq \alpha_1 \\ 2 \; if \; \alpha_1 \leq y_i^* \leq \alpha_2 \\ \ldots \ldots \ldots \ldots \ldots \ldots \ldots \\ 5 \; if \; y_i^* \geq \alpha_4 \end{cases}$$

, where $\alpha_1, \ldots, \alpha_4$ are cut off points

For an ordered logit, F is a logistic cumulative density function given by:

$$\mathrm{F}(\mathrm{X_i'}\beta) = \frac{e^{\mathrm{X_i'}\beta}}{1+e^{\mathrm{X_i'}\beta}} \quad \ldots\ldots (2)$$

Subjective wellbeing (life satisfaction) is the dependent variable. Life satisfaction is measured using a Cantril Ladder developed by Hadley Cantril in 1965 with a scale ranging from 1 to 10, where 1 means "very dissatisfied" and 10 means "very satisfied". In this paper, the number of life satisfaction categories are reduced from 10 to five following [17] who alluded that the scale of "Life satisfaction" variable can be reduced from one to 10 to one to five by combining two consecutive categories in order to simplify the output.

Smoking status is the explanatory variable of interest. The variable is binary in nature, where smoking status equals one if an individual is a cigarettes smoker and zero otherwise. The socioeconomic and demographic characteristics controlled for are heath status, gender, age, population group (race), and employment status.

The paper used Wave 5 cross-sectional data from the 2017 National Income Dynamics Study (NIDS[2]) study for South Africa (Version 1.0.0 published in 2018), compiled South African Labour and Development Research Unit (SALDRU), a division affiliated at University of Cape Town. NIDS is a country representative survey which began 2008 with a sample of over 28000 individuals in 7300 households. The survey examines livelihoods of households and individuals over time. The dataset is

[2] NIDS is an open data source available for download at DataFirst. DOI: https://doi.org/10.25828/fw3h-v708

suitable because it captures both adults smoking status and self-reported level of life satisfaction.

Results and Discussion

Descriptive Statistics

This section presents the results of the analyses. The starting point of the analysis starts with an overview of the distribution of life satisfaction level by socioeconomic factors and demographic characteristics. In Table 1 descriptive analyses, the data were weighted using calibration weights provided by NIDS.

Table 1 shows that about 35% of the adult sample reported being dissatisfied with life where dissatisfied refers to a satisfaction value of two or less i.e., a satisfaction level equal to four or less on Hadley Cantril 10-point scale. This indicates that the majority of individuals in the adult sample reported being satisfied with life. However, it is imperative to acknowledge that most individuals (about 31%) fell under the satisfaction value of three i.e., reported satisfaction level of five and/or six.

At the bottom of the life satisfaction ladder, the percentage of adult smokers who reported being dissatisfied with life is higher by 3.7 percentage points than those adult nonsmokers who reported being dissatisfied with life. About 34% of adult nonsmokers reported a satisfaction level of seven or more which is higher than that of adult smokers by 3.52 percentage points. There is no significant difference between men's and women's reported life satisfaction levels in the sample.

Africans and Indians/Asians have a high percentage of individuals who reported being dissatisfied with life. A high percentage of Whites and Coloured reported being highly satisfied with life. A high percentage of not economically active, discouraged and individuals searching for a job reported life dissatisfaction while the majority of employed individuals reported high levels of life satisfaction. Not economically active and employed individuals have a higher percentage of being very satisfied with life compared to other groups. The majority of individuals with poor and fair health status reported being dissatisfied with life while adults with good, very good, and excellent health status reported high levels of life satisfaction. Older people reported higher life satisfaction levels compared to youth and prime age groups.

Ordered logit regression results

Since Table 2 (see Appendix 1) shows ordered logit regression coefficients, the interpretation will focus on the direction of effect, not magnitude. As expected, the smoking status variable "smokers" has a negative coefficient which is significant at a 1% level. Thus, adult cigarette smokers are less likely to report higher levels of life satisfaction compared to nonsmokers, *ceteris paribus*. Coloureds, Whites, and Indians/Asians are more likely to report higher levels of life satisfaction than Africans, *ceteris paribus.* Individuals with fair, good, very good, and excellent health status are more likely to report being satisfied

with life compared to individuals with poor health status. Employed individuals are more likely to report high life satisfaction levels than individuals who are not economically active, *ceteris paribus*.

However, the best way to interpret the ordered logit regression results is via the average partial effects. The average partial effects are summarized in Table 3.

Table 3 demonstrates that there is a significant difference between the subjective well-being of cigarette smokers and nonsmokers. Adult smokers are 3.25 percentage points more likely to be in life satisfaction level one (i.e. reported satisfaction level of one to two in the original scale), 3.97 percentage points more likely to be in life satisfaction level two (three or four on the original scale), 0.23 percentage points less likely to be in life satisfaction level three, 3.71 percentage points less likely to be in satisfaction level of four and 3.28 percentage points less likely to be in satisfaction level of five (i.e. reported satisfaction level of nine to ten in the original scale) compared to non-cigarette smokers, *ceteris paribus*. The results suggest that adult smokers reported either being completely dissatisfied or dissatisfied with life compared to non-smokers. The result is consistent with [6] who found that cigarette smokers are less likely to report higher levels of life satisfaction than non-smokers. Hence, the finding may be used as part of the evidence to dispute one of the common myths about smoking that nicotine in cigarettes relieves stress and helps people to relax and enjoy their lives. Smoking may cause various diseases and disorders, ranging from gum disease to lung cancer, cardiac problems, and blindness. The complications and discomfort from these diseases may affect individuals' life satisfaction perception.

Control variables have signs consistent with a priori expectation and most of them are significant at 1% level. Although control variables are not at the center of analysis here, they are briefly discussed for completeness' sake. The gender variable is insignificant indicating that there is no significant difference between the life satisfaction probability structure of males and females.

The Coloured coefficients suggest that Coloureds are 4.60 percentage points less likely to be in life satisfaction value one, 6.44 percentage points are less likely to be in life satisfaction value two (three or four), 0.61 percentage points less likely to be in life satisfaction value three, 6.05 percentage points more likely to be in satisfaction value of four and 5.59 percentage points more likely to be in satisfaction value of five than Africans, *ceteris paribus*. In addition, Indian/Asians are 2.89 percentage points less likely to be in life satisfaction value one, 3.75 percentage points less likely to be in life satisfaction value two, 3.57 percentage points more likely to be in satisfaction value of four, and 2.98 percentage points more likely to be in satisfaction value of five than Africans, *ceteris paribus*. However, there is no significant difference in the probability structure of Indians/Asians and Africans at a satisfaction value of three. Whites are 8.36 percentage points less likely to be in life satisfaction value one, 13.9 percentage points less likely to be in life satisfaction value two, 6.33 percentage points less likely to be in life satisfaction value three, 11.8 percentage points more likely to be in satisfaction value of four and 16.9 percentage points more likely to

be in satisfaction value of five than Africans, *ceteris paribus*. The difference among reported subjective well-being is stronger for Whites and Coloureds than for Indians/Asians. The finding indicating that non-African population groups are more likely to report higher levels of life satisfaction level than Africans is intuitive because Africans are on average the most impoverished group, so they are expected to have a lower quality of life compared to other race groups.

The results in Table 3 show that there is no significant difference in the life satisfaction probability structure of discouraged, unemployed, and not economically active (base category) individuals. However, there is a strongly significant difference between the subjective well-being of employed and not economically active individuals. Employed individuals are 2.20 percentage points less likely to report a satisfaction value of one, 2.72 percentage points less likely to report a life satisfaction value of two, 0.15 percentage points more likely to report a life satisfaction value of three, 2.54 percentage points more likely to report satisfaction value of four and 2.24 percentage points more likely to report satisfaction value of five compared to not economically active individuals. A significantly higher satisfaction level reported by the employed suggests that employed individuals are better off than non economically active individuals. This may be because employed people can afford to pay for holiday resorts where they enjoy activities such as horse riding, canoeing, fishing, and game viewing. All these activities increase life satisfaction.

Individuals with health status categorized as excellent are 11.3 percentage points less likely to report a satisfaction value of one, 9.96 percentage points less likely to report a life satisfaction value of two, 4.04 percentage points more likely to report a life satisfaction value of three, 9.98 percentage points more likely to report satisfaction value of four and 7.28 percentage points more likely to report satisfaction value of five compared to those categorized under poor health status, *ceteris paribus*. Those individuals categorized under very good health status are 10.4 percentage points less likely to report a satisfaction value of one, 8.64 percentage points less likely to report a life satisfaction value of two, 4.09 percentage points more likely to report a life satisfaction value of three, 8.77 percentage points more likely to report satisfaction value of four and 6.15 percentage points more likely to report satisfaction value of five compared to those categorized under poor health status. The same interpretation also applies to good and fair health status categories since the signs are the same and the only difference is in the magnitude of effects. Having at least a fair health status increases the probability of reporting higher levels of life satisfaction. The result support [8] who alluded that individuals derive disutility from poor health status and utility from at least good health. Hence, we expect individuals with at least fair health status to report higher levels of life satisfaction.

Conclusion

The main objective of the paper was to determine whether cigarette smokers in South Africa experience lower life satisfaction than non-smokers. The paper applied an ordered logit regression to a cross-section of Wave 5 NIDS data and found that cigarette smokers are less likely to report high levels of life satisfaction compared to non-smokers. Thus, the results indicate that, based on the adult sample used, non-smokers experience more life satisfaction than cigarette smokers in South Africa. The results also suggest that cigarette smoking has a measurable negative effect on an individual's subjective well-being. Therefore, programs aimed at helping smokers to overcome their addiction such as cessation therapies and pre-emptive education are recommended as a policy response.

Figures and Tables

Table 1. Life Satisfaction level by socioeconomic factors and demographic characteristics (%).

	Satisfaction value				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Overall	11.35	23.57	31.45	21.83	11.80
Smoking Status					
No	10.66	23.46	31.54	22.03	12.30
Yes	14.10	23.72	31.37	21.10	9.71
Gender					
Male	11.45	24.35	30.66	22.39	11.15
Female	11.26	22.89	32.15	21.33	12.36
Race					
African	12.87	25.12	31.61	19.59	10.81
Coloured	7.41	17.59	36.76	24.61	13.63
Indian/Asian	1.72	31.08	30.91	27.55	8.73
White	1.90	11.29	23.56	41.79	21.46
Employment Status					
NEA	14.06	24.43	29.36	20.38	11.77
Discouraged	7.25	28.93	32.30	22.42	9.11
Searching	10.84	25.84	34.67	19.92	8.73
Employed	9.15	22.19	32.57	23.57	12.53
Health Status					
Excellent	9.81	22.58	31.00	22.72	13.89
Very good	9.79	23.25	32.89	23.39	10.68

Good	12.00	24.57	31.42	20.54	11.46
Fair	16.68	25.37	30.97	18.68	8.30
Poor	28.61	26.40	20.79	12.91	11.29
Age Category					
Youth (18-29)	11.25	22.60	32.29	22.20	11.66
Prime (30-49)	11.42	24.90	31.73	20.53	11.42
Older(50+)	11.39	22.80	29.62	23.51	12.69

Table 2. The ordered logit regression results

Variables	**Coefficients**
Smoking Status	
Smokers	-0.327***
	(0.0584)
Gender	
Male	0.00784
	(0.0410)
Population group/Race	
Coloured	0.516***
	(0.0618)
Asian/Indian	0.299***
	(0.115)
White	1.211***
	(0.0681)
Health Status	
Excellent	0.911***
	(0.157)
Very good	0.805***
	(0.155)
Good	0.688***
	(0.154)
Fair	0.425***
	(0.163)
Age	0.00119
	(0.00122)
Employment Status	
Discouraged	0.112
	(0.139)
Unemployed	0.0287
	(0.0593)
Employed	0.223***
	(0.0415)
/cut1	-1.107***
	(0.180)
/cut2	0.363**
	(0.179)
/cut3	1.721***
	(0.181)

/cut4	3.100*** (0.183)
Observations	23,669

Note: (a) Standard errors in parentheses, (b) *** and ** means statistically significant at 1% and 5% respectively.

Table 3. Marginal effects for ordered logit estimation

Satisfaction value	Marginal effects				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Smoking Status					
Smokers	0.0325***	0.0397***	-0.00228**	-0.0371***	-0.0328***
	(0.00598)	(0.00697)	(0.000982)	(0.00658)	(0.00589)
Gender					
Male	-0.000779	-0.000953	5.47e-05	0.000890	0.000787
	(0.00407)	(0.00498)	(0.000289)	(0.00465)	(0.00411)
Population group/Race					
Coloured	-0.0460***	-0.0644***	-0.00605**	0.0605***	0.0559***
	(0.00490)	(0.00761)	(0.00267)	(0.00709)	(0.00765)
Indian/Asian	-0.0289***	-0.0375***	0.000920	0.0357***	0.0298**
	(0.0100)	(0.0144)	(0.00207)	(0.0136)	(0.0127)
White	-0.0836***	-0.139***	-0.0633***	0.118***	0.169***
	(0.00389)	(0.00694)	(0.00714)	(0.00542)	(0.0123)
Employment Status					
Discouraged	-0.0116	-0.0136	0.00155	0.0128	0.0108
	(0.0137)	(0.0169)	(0.00108)	(0.0158)	(0.0139)
Unemployed	-0.00305	-0.00346	0.000552	0.00328	0.00268
	(0.00627)	(0.00716)	(0.00109)	(0.00678)	(0.00556)
Employed	-0.0220***	-0.0272***	0.00147**	0.0254***	0.0224***
	(0.00413)	(0.00510)	(0.000680)	(0.00476)	(0.00422)
Health Status					
Excellent	-0.113***	-0.0996***	0.0404***	0.0998***	0.0728***
	(0.0252)	(0.0129)	(0.0138)	(0.0155)	(0.00929)
Very good	-0.104***	-0.0864***	0.0409***	0.0877***	0.0615***

	(0.0251)	(0.0127)	(0.0138)	(0.0153)	(0.00889)
Good	-0.0920***	-0.0720***	0.0397***	0.0743***	0.0500***
	(0.0250)	(0.0125)	(0.0138)	(0.0152)	(0.00876)
Fair	-0.0617**	-0.0410***	0.0307**	0.0445***	0.0276***
	(0.0259)	(0.0137)	(0.0140)	(0.0162)	(0.00948)
Age	-0.000119	-0.000145	8.34e-06	0.000136	0.000120
	(0.000121)	(0.000148)	(8.99e-06)	(0.000138)	(0.000122)
Observations	23,669				

Note: (a) Standard errors in parentheses, (b) *** and ** means statistically significant at 1% and 5% respectively

References

[1] British American Tobacco., 2017, The Global Market. Available at: https://www.bat.com/group/sites/uk__9d9kcy.nsf/vwPagesWebLive/DO9DCL3B/$FILE/medMDAKAJCS.pdf. Last accessed 31 October 2020.

[2] Wilmans, G. and Rashied, N., 2020, The effect of cigarette smoking on subjective well-being in South Africa and its implications for tobacco control. *Journal of Economic and Financial Sciences*, *13*(1), 1-11.

[3] Van Walbeek, C., 2005, *The economics of tobacco control in South Africa* (Doctoral dissertation, University of Cape Town, Cape Town).

[4] Bilano, V., Gilmour, S., Moffiet, T., D'Espaignet, E.T., Stevens, G.A., Commar, A., 2015, Global trends and projections for tobacco use, 1990–2025: An analysis of smoking indicators from the WHO comprehensive information systems for tobacco control', *The Lancet* 385(9972), 966–976. https://doi.org/10.1016/S0140-6736(15)60264-1

[5] Van Walbeek., 2003, Tobacco excise taxation in South Africa. Geneva: World Health Organization.

[6] Wilmans, G., 2018, *Smoking and subjective wellbeing in South Africa* (M.Com dissertation, University of Johannesburg).

[7] Wang, M.P., Wang, X., Lam, T.H., Viswanath, K. and Chan, S.S., 2014, Ex-smokers are happier than current smokers among Chinese adults in Hong Kong. *Addiction*, 109(7), 1165–1171. https://doi.org/10.1111/add.12531

[8] Grossman, M., 1972, On the concept of health capital and the demand for health. *Journal of Political economy*, *80*(2), pp.223-255.

[9] Oswald, A.J. & Wu, S., 2010, Objective confirmation of subjective measures of human well-being: Evidence from the USA. *Science*, 327(5965), 576–579. https://doi. org/10.1126/science.1180606

[10] Chang, T., Chu, H.P., Deale, F.W. & Gupta, R., 2015, The causal relationship between happiness and smoking: A bootstrap panel causality test. *Journal of Happiness Studies*, 17(3), 1327–1336. https://doi.org/10.1007/s10902-015-9645-5

[11] Barros, V.V., Kozasa, E.H., Formagini, T.D.B., Pereira, L.H. and Ronzani, T.M., 2015, Smokers show lower levels of psychological well-being and mindfulness than non-smokers. *PloS one*, *10*(8), p.e0135377.

[12] Weinhold, D. and Chaloupka, F.J., 2016, Smoking status and subjective wellbeing in Tobacco control. *LSE Online Publications*, London, viewed 18 December 2020, from http://eprints.lse.ac.uk/66153/1/Weinhold_Smoking_Status.pdf.

[13] Leszczensky, L. and Wolbring, T., 2018, *How to deal with reverse causality using panel data? Recommendations for researchers based on a simulation study*, viewed 20 June 2020, from https://doi.org/10.31235/osf.io/8xb4z

[14] Vaisey, S. and Miles, A., 2017, What you can – And can't – Do with three-wave panel data. *Sociological Methods & Research*, 46(1), 44–67. https://doi.org/10.1177/ 0049124114547769

[15] Clark, A.E. and Oswald, A.J., 1994, Unhappiness and unemployment. *The Economic Journal*, *104*(424), 648-659.

[16] Cameron, A.C. and Trivedi, P.K., 2005, *Microeconometrics: methods and applications*. Cambridge university press.

[17] Lloyd, N. and Leibbrandt, M., 2014, New evidence on subjective well-being and the definition of unemployment in South Africa. *Development Southern Africa*, *31*(1), pp.85-105.