

A TEST OF SATISFACTION, EXPERIENCE AND HOURS OF WORK AS MEDIATORS OF THE RELATIONSHIP BETWEEN EDUCATION AND INFORMAL EARNINGS

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Abstract

At the heart of policies aimed at eliminating informal street trading seems to be a 'marginalist' perspective of the sector which does not see it as contributing to socio-economic development. What is not clear, however, is what underlies the financial dysfunctionality associated with the sector. Using a sample of 303 inner city street traders drawn from Johannesburg, a large South African city, tests of regression and mediated regression were used to test theory that predicts the existence of certain human capital relationships that may contribute to increased earnings for these traders. Findings suggest that certain human capital relationships in this sector may differ from those normally found in formal working contexts, in that although education is significantly associated with earnings, continuance satisfaction, experience and expenditure of effort, or hours worked per day, all do not mediate relationships between education and earnings. It is suggested that current policies might be keeping traders in a state of 'flux', where human capital transmission to financial performance might be unable to take root through seeking to 'crack down' on the sector instead of investing in the sector to enable its functionality, and hence its potential contribution to economic development.

Keywords

Human Capital; Local government; Policy; Johannesburg; South Africa

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1. INTRODUCTION

According to the tenets of human capital theory (Mincer, 1958; Becker, 1964), investments in learning and knowledge in the form of human capital are expected to contribute to increased individual productivity. Human capital investments also contribute to productivity at the level of countries (Ahmed & Krishnasamy, 2013), as well as at the level of the global economy (Butnaru & Matei-Gherman, 2012). Human capital has an especially important role to play in the economic development of countries in the Sub-Saharan African context, where resource constraints have held back investments in education (Zelleke, Sraiheen & Gupta, 2013). Despite a voluminous body of literature that supports the tenets of human capital theory across different contexts, research in the inner-city street trading sector seems to contest its predictions.

The informal trade sector has become an important part of the South African economy (Ligthelm, 2005); approximately 60% of developing country employment is in the informal sector, as the formal sector has been unable to absorb labour and production processes in the same way (Sinha, 2010). The informal sector is typically defined as economic activities that involve the production or distribution of goods and services that are not registered and regulated in contexts where similar activities are regulated (United Nations, 1996).

Within the informal sector, street traders can be differentiated into two categories: survivalist versus more 'entrepreneurial' traders (Urban, 2012). This differentiation might reflect a differentiation of the sector by functionality – a dysfunctional survivalist sector versus a more functional entrepreneurial sector (Callaghan, 2014). Street traders in the Johannesburg city centre have been found to differ in their relative endowments of entrepreneurial orientation (Callaghan, 2010), and therefore in their functionality.

The dysfunctionality of the sector may also extend to returns to financial capital, as well as human capital relationships; one aspect of this is perhaps explained by the predictions of the nutritional model of efficiency wage theory, which predicts that if individuals do not earn enough to support their physical needs they will be less productive (Liebenstein, 1957). This theory may, to some extent, predict the absence of a return on financial as well as human capital in the sector.

A tension between two contrasting predictions is therefore present in the literature. On the one hand, the predictions of human capital (Becker, 1964) imply that the informal sector should, on the whole, be a 'developmental space' where learning will transmit to productivity improvements over time, enabling entrepreneurial performance 'up' and perhaps 'out' of the sector (De Soto, 1989). On the other hand, 'dysfunctionality theory' (Callaghan, 2011) predicts that the sector is fundamentally dysfunctional, and that financial capital operates in a dysfunctional way in the sector and that human capital relationships in this sector might also reflect this dysfunctionality. In other words, the survivalist component of the sector might not reflect functional relationships as in other sectors where financial capital and human capital obtain typical returns to their investment.

This study attempts to investigate the tension between these two different theoretical tensions (between the predictions of human capital theory versus dysfunctionality theory), by testing (i) the extent to which human capital, in the form of education, obtains a return in this context as well as (ii) the extent to which the relationship between human capital, in the form of education, and earnings is mediated by, firstly, the satisfaction of a street trader with continuing in street trading, secondly, the learning that occurs over time in the form of experience, and, thirdly, the expenditure of additional effort, or hours worked, in the sector. On the basis of the findings,

recommendations are made for how to better enable the upliftment of these traders, by increasing the 'functionality' of the sector. The argument is made that if functionality can be enabled in the sector then it could better contribute to socio-economic development. This research is considered important, for the following reasons.

Firstly, policy makers face a dilemma. City planners and local governments have typically regarded informal street trading as unsightly and problematic (Holness, Nel & Binns, 1999). Certain academic research has recommended more extensive regulation of the sector, yet in contrast others have argued for a developmental approach by policy makers (Callaghan, 2014).

Policy makers have, however, often simply sought to forcefully eradicate informal street trading (Holness et al., 1999). A recent example of this is 'Operation Clean Sweep', in which the Johannesburg Metro Police forcefully emptied the streets of the city of informal traders, at great human cost, of an estimated 6000-8000 traders, an action considered by some to violate the constitutional rights of the city's most powerless and vulnerable. Subsequently, the South African Constitutional Court has intervened to rule that municipal authorities should refrain from interfering with the activities of licensed traders. *If informal street trading will occur in any event*, then it might make sense to try and understand how it can contribute to socio-economic development. Through investigating the operation of human capital in this context, this research offers new perspectives of how to do this, and, hopefully, reduce the human costs associated with policy applications in this sector that are not guided by research.

Secondly, by investigating the mechanisms of human capital in this sector, knowledge is contributed that can specifically help to understand how the functionality of the sector can be enabled. It is argued that the human costs associated with forced removals are the result of policies based on 'marginalist' assumptions of the sector, as policy makers have sought to crack down on the sector rather than invest in it to increase its functionality. Marginalist assumptions are taken here to mean assumptions that regard the sector as non-functional, or to make little or no contribution to socio-economic development, or upliftment. However, in order to contest marginalist assumptions, it may be necessary to demonstrate specifically how the functionality of individuals working in the sector can be enabled – or specifically how they are currently dysfunctional, and how this can be addressed.

Arguably, apart from its fundamental role in absorbing surplus labour, the sector suffers from significant dysfunctionality in that financial and human capital may not necessarily accrue returns in the sector due to high levels of survivalist activity. However, it is argued that if policies were based on research-based perspectives of the sector then policy makers would concentrate on reducing the dysfunctionality in the sector so that human capital investments do accrue a return on their investment. It is argued that this approach is more helpful, and that policy investments targeted at human capital investments might fundamentally change the nature of the sector.

This article is structured as follows. First, literature is reviewed in order to provide context to the study. Next, the conceptual model of the relationships tested in this research is outlined, and hypotheses are derived. The methodology applied in the research is then considered, whereupon the results of the tests of the hypotheses are reported and discussed. The article concludes with a consideration of the conclusions of the study and recommendations for theory and further research.

2. LITERATURE AND THEORY

Since 1994, political, social and economic change has followed the democratisation of the country (Padayachee, 2005), and this process has resulted in large inflows of migrants from other areas of the country and immigrants from other African countries, swelling the ranks of the informal sector, and particularly inner-city street trading (Hunter & Skinner, 2003; Peberdy & Rogerson, 2003). Immigrant traders, however, typically face tensions related to competition with local traders (Sidzatane & Maharaj, 2013). Hostility from South African traders, however, is not the only source of hostility they experience. Both South African and foreign-born traders face hostility on the part of policy makers, and traders typically perceive municipal authorities and regulations also to be hostile to their efforts to operate and grow their enterprises (Hunter & Skinner, 2003; Sidzatane & Maharaj, 2013). Economic and other shocks to the informal economy are typically disproportionately borne by the most vulnerable in the sector, and particularly by females (Horn, 2010). The sector is particularly vulnerable to policy actions such as 'Operation Clean Sweep'.

The implementation of Operation Clean Sweep by the City of Johannesburg, while at odds with the subsequent constitutional rulings, seems to follow the precedent of other regional efforts to eliminate street trading, such as Zimbabwe's Operation Murambatsvina, in which tens of thousands of informal traders experienced the violent destruction of houses, businesses and jobs (Musoni, 2010).

With regard to efforts to eliminate the informal sector and instead focus on development only in the formal sector, this is problematic, as the "key to policy development is to recognise that both sectors incorporate creativity, entrepreneurial flair, and a general desire to harness human capital in ways that maximises its potential" (Daniels, 2004:501). Following this logic, it is argued that policy should seek to develop the functionality of human capital and its relationships with productivity in this sector in order to increase the potential for positive externalities.

Efforts to suppress the informal sector are also problematic, as it is generally acknowledged in the literature that it has the capacity to absorb surplus labour capacity. What is, however, unclear in the literature is the extent to which the informal sector has the "capacity to alleviate urban poverty and boost economic development" (Holness et al., 1999:286). Despite perceptions by urban planners that informal activity is "unsightly, a significant health and safety hazard" (Holness et al., 1999:286), evidence from yet other contexts suggests that city street vendors can attract shoppers into the city centre, particularly through their offerings of fresh produce and ethnic foods, irrespective of hygiene standards (Rajagopal, 2010). Similarly, in the Latin American context, street markets "are preferred as leisure shopping destination[s] by the middle socioeconomic level consumers in urban habitat[s]" (Rajagopal, 2010:104).

This body of literature seems to indicate that evidence of the net positive or negative externalities generated by the inner-city street trading context is as yet unclear. Authorities may therefore require further research and evidence in order to be able to design and apply appropriate policy responses. The street trading literature, however, seems to show that relatively high levels of dysfunctionality persist in the sector. It is argued that if state intervention in the sector is premised on a developmental approach, instead of one based on marginalist perspectives, then this should focus on enabling functional relationships, which might increase the extent to which the sector could contribute to developmental objectives. Research suggests that for many street traders the decision of what to sell is based on their ability to 'run away from' Metropolitan Police,

while carrying their wares (Tissington, 2009). It is also argued that it is the uncertainty and hostility inherent in the context itself that may result in dysfunctional relationships, and may 'trap' many in the sector in a survivalist state. Traders might not be able to obtain a 'functional' return on their human capital investments if they do not earn enough to maintain their physical health and productivity (Liebenstein, 1957).

However, these arguments are premised on the broader argument that human capital effects typical of other contexts are absent, or diminished, in this context. The primary focus of this research is therefore the investigation of human capital relationships in this context.

3. PROBLEM INVESTIGATED

The problem investigated in this study is the lack of knowledge, or the absence of literature, that relates to how certain core human capital mechanisms contribute to the productivity, or earnings, of informal street traders. There seem to be three dimensions of this lack of knowledge that are addressed in this research; these relate to the transmission of general human capital in the form of literacy, numeracy and other learning investments (Becker, 1964) to productivity, or gross earnings, and the way continuance satisfaction, experience and investments in effort associated with hours worked per day mediate this association (between general human capital and earnings). Having provided an outline of the context of the research, and the problem addressed, the conceptual model is now introduced.

4. THE CONCEPTUAL MODEL

This research sought to establish the extent to which certain human capital relationships are present across the inner-city street trading population of a large city. The research question posed in this study was therefore: *Do continuance satisfaction, experience and effort invested in the form of hours worked per day mediate the relationship between education (general human capital) and gross earnings in the inner-city street trading context?* In other words, how does general human capital, in the form of schooling education, transmit to improved street trader outcomes in the form of earnings through the paths of continuance satisfaction, time spent in the sector and though effort expended in the form of hours worked per day in the sector? However, in order to answer this research question, knowledge of the relationship between education and earnings is important, and so a first model of the relationships between education and earnings per day, which included a host of covariates (namely, gender, age, and initial investment at start-up together with the proposed mediators), was tested.

Drawing from human capital theory (Becker, 1964), and the extant literature, a conceptual model of the three hypothesised mediation relationships is represented in FIGURE 1. Four predictors of gross earnings per day are included in the model: continuance satisfaction, experience, and hours worked per day, as well as total education. These relationships are discussed further in the sections that follow, and hypotheses that relate to certain of these relationships are derived.

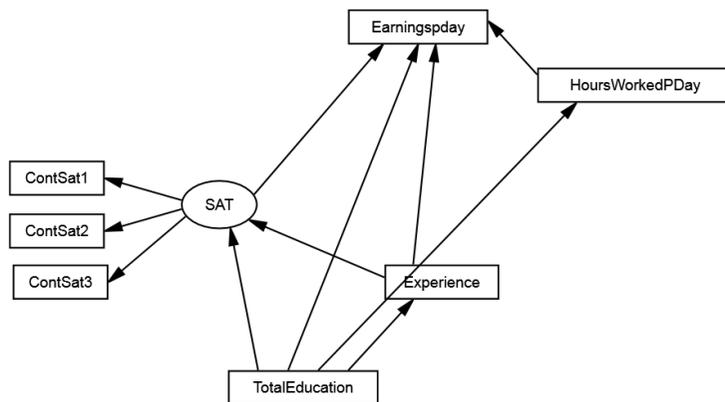


FIGURE 1: The tested model of human capital mediation relationships

Source: Author's analysis

Notes: Abbreviations. Continuance Satisfaction= ConSat for measured variables. Continuance Satisfaction= SAT for latent variable. Hours Worked per Day= HoursWorkedPDay

This model attempts to test the extent to which the sector may reflect certain functional human capital relationships, or the extent to which human capital-related relationships that have generalised across most working contexts generalise to this one. These investigations allow for an understanding of the extent of dysfunctionality present in certain human capital relationships in this context. It is argued that these findings would have important implications for the management of the sector. If human capital 'functionality' were enabled across the sector, then wealth creation could be enabled and the developmental potential of the sector might be significantly improved.

5. RESEARCH HYPOTHESES

The psychological literature indicates that knowledge acquisition, or learning, and knowledge depreciation (unlearning) follow different processes and rules (Kim & Seo, 2009). Investments in learning and knowledge in the form of schooling are expected to transmit to street trader earnings due to general human capital effects (Becker, 1964). Levels of literacy and the ability of an individual to calculate operational expenditures (numeracy) are examples of skills associated with schooling that, as general human capital, are expected to contribute to increased productivity across different contexts (Becker, 1964). On the basis of this body of theory, hypothesis 1 is derived, that *there is a significant association between total education and street trader earnings*. This relationship is represented by the arrow running from total education to earnings in FIGURE 1.

The influence of schooling is not, however, independent of other influences. Dissatisfaction can disable efforts expended by individuals in work contexts (Organ, 1988; 1997). Following Organ (1988; 1997), satisfaction may therefore be a necessary albeit not a sufficient condition for the expenditure of high levels of effort in working contexts. In other words, for general human capital endowments (such as the literacy and numeracy associated with higher levels of schooling) to

transmit to productivity, satisfaction, and the engagement related to it (Organ, 1988; 1997), is required. It is therefore expected that satisfaction with continuing in street trading in this context would mediate the relationship between schooling as a form of general human capital and street trader earnings. Current research into human capital transfer has found that job dissatisfaction (low levels of job satisfaction) can constrain the transfer of learning from training to work contexts, underscoring the importance of the role of satisfaction in human capital transmission (Jodlbauer, Selenko, Batinic & Stiglbauer, 2012). According to this body of literature, a negative association between dissatisfaction with continuance and street trader earnings is predicted in this context. Further, previous research in the informal context has differentiated between necessity-driven versus opportunity-driven (Urban, 2011) traders, or survivalist traders with no other choice versus entrepreneurial traders who exercise entrepreneurial intentions, or choice (Bird, 1988). The satisfaction of a trader with continuing in street trading is considered to reflect differences along this dimension; entrepreneurial traders are typically more likely to be in a sector voluntarily, and would be expected to be more satisfied with continuance in an entrepreneurial activity. In contrast, survivalist trading has been conceptualised as ‘involuntary’ continuance (Callaghan, 2014), as is the case for those using the sector because they have no other choice, hoping for employment opportunities outside the sector; these traders would be expected to be less satisfied with continuance. Hypothesis 2 is therefore offered, that *continuance satisfaction mediates the association between total education and street trader earnings*. This relationship is represented by the arrows running from total education to satisfaction (SAT) and from satisfaction to earnings in FIGURE 1.

According to human capital theory, experience, or time spent in street trading, is a form of specific human capital, in that it is expected to contribute to productivity increases in this specific context (Becker, 1964). The mechanism through which general human capital transmits its productivity effects, however, is expected to be enabled through experience in street trading. In other words, the influence of specific human capital (experience) might mediate the influence of schooling (general human capital) on productivity, or street trader earnings. Hypothesis 3 is therefore posited, that *experience mediates the association between total education and street trader earnings*. This relationship is represented by the arrows running from total education to experience and from experience to earnings in FIGURE 1.

The numeracy, literacy, and other investments in knowledge from schooling that exists as general human capital (Becker, 1964) is expected to transmit to higher levels of productivity, reflected in earnings, through mechanisms related to the investment of time and effort. According to Ligthelm (2008:367), only between 10% and 15% of informal entrepreneurs “have sufficient business skills to expand and develop their businesses”, and the majority of informal businesses operate as “survivalist entities with limited development and growth potential”. However, it is important to know the role effort investments in the sector play in mediating, or channelling, the effect of skills associated with schooling (particularly education-related numeracy and literacy skills) to earnings in this sector. Hence, Hypothesis 4 is proposed, that *hours worked per day mediates the association between total education and earnings per day*. This relationship corresponds to the arrows running from total education to hours worked per day and from hours worked per day to earnings in FIGURE 1. Having introduced the hypotheses to be tested, the methods of the study are now discussed.

6. RESEARCH METHODOLOGY

The research methodology is explained in the following two sections, which relate to the sample selected and to the tests performed, respectively.

6.1. The sample selected

The population of the study comprised all street traders operating in the central business district of the city of Johannesburg. The study was undertaken in 2010. A sampling frame was developed, which comprised 228 city blocks. This covered the area between Plein, End, Faraday and Sauer streets. In order to estimate the population size, random number tables were used, and a 10% sample of these blocks was identified (23 blocks). A count of the traders on these blocks provided an estimate of the inner city street trading population, of approximately 5 000 traders. Three hundred and three street trader respondents were sampled.

Refusals were unconditionally respected. A sample size calculation was performed in order to ensure that statistical inferences could be made about relationships at the 5% level of significance. The sample size calculation suggested that a sample of 300 would produce the size of effects required for inferential statistics if the 5% level of significance was used to differentiate between significant and non-significant associations. The sample size was therefore taken to comprise approximately 6.06% of the population.

6.2. Tests performed

SPSS 21 and Stata 12 were used to analyse the data. Scale items were developed based on precedent. Earnings were measured as gross earnings per day. It was not possible to ascertain the net earnings of traders, and gross earnings were used as a measure instead. Continuance satisfaction was measured using items adapted from the Minnesota Satisfaction Questionnaire scales (Arvey, Bouchard, Segal & Abraham, 1989), which were found to have a scale reliability coefficient (Cronbach alpha value) of .9387, and an average item covariance of .686.

Experience was measured as years of street trading experience. Hours worked per day were measured as that. Initial investment at start-up was measured as the financial investment a trader used to start his/her business. This was included as a covariate in order to control for differences in resource endowments of traders at entry into the sector. Age was also included as a covariate factor, measured in years, as was gender, tested as a dummy variable.

First, in order to test hypothesis 1, a modified Mincerian earnings function was used to test the relationship between education and street trader earnings. In this instance, the Mincerian model was modified to include the effects of gender, age, initial investment, continuance satisfaction, experience and hours worked per day as covariates. The testing of this model was used to gain an understanding of the 'anchor relationship' of the process of testing that followed; the relationship between education and earnings.

Second, in order to test the mediation relationships relating to hypotheses 2, 3 and 4, tests of mediated regression were used, following the precedent of Barron and Kenny (1986). The results of the univariate, bivariate and multivariate analyses are now reported and discussed.

7. RESULTS/FINDINGS

The discussion of the multivariate results is undertaken under the headings of each of the tested hypotheses. Multivariate results are used to either reject or accept the tested null hypotheses in each instance. However, before the testing of the hypotheses is discussed, the results of the univariate and bivariate analyses are considered.

7.1 Univariate analysis

TABLES 1 and 2 report the descriptive statistics of the constructs. The mean years of education of a street trader in this context is 9.94 years, which is the equivalent of a 'grade ten' level; two years short of a school-leaving level of education in this context. Given the high numbers of traders from other countries in the sector, it is also possible that the levels of schooling in this context might differ in quality, given that such schooling may have been in under-resourced or resource-constrained contexts. It is possible that low levels of education represent one dimension of potential dysfunctionality in this context; low levels of general human capital (Becker, 1964) across the sector are expected to be associated with low levels of literacy and numeracy, which in turn may impede productivity. The mean time spent by a trader in this context is 6.45 years. This suggests that the sector is typically not a permanent destination for those entering it. It is possible that it is used as a stepping stone to other activities, formal or informal, that are outside of the city centre.

The mean hours worked by a trader is 10.7 hours per day. The median value is 11 hours per day. This suggests that about half of the respondents in fact might work longer than this. Traders seem to work relatively long hours. However, when the bivariate associations are taken into account, it seems that individuals who are more satisfied expend more effort in the sector; they work more hours. But traders who work more hours are not found to earn more than traders that work fewer hours. This is an atypical relationship, perhaps reflecting another dimension of dysfunctionality in this sector.

The mean earnings of a trader in this context are R351,58. However, the median value is R230. Taking the median value as a more robust indicator of earnings for these traders, assuming a perhaps arbitrary margin of 50%, the median trader might net about R115 per day. This implies that half of the sector might net less than this. On the basis of the potential for non-normality in the underlying distribution of the data, non-parametric bivariate tests were used and bootstrapped confidence intervals were used to check the associations of the multivariate analysis.

Overall, the univariate results suggest that a large number of street traders in this context earn relatively little and work relatively long hours, yet do not typically stay in the sector for more than about six or seven years.

7.2 Bivariate analysis

According to the bivariate analysis (TABLE 1), years of education are inversely associated with years of experience in the sector. This might reflect a situation where more educated traders are more likely to leave the sector earlier. The absorption rate for those with higher levels of education may therefore be higher. Traders who have higher levels of education are found to earn significantly more in the sector.

TABLE 1: Descriptive statistics and Spearman Rho correlations between constructs used in the mediation analysis

Variable	Mean Units	Standard Deviation	Education	Experience	Hours worked per day	Satisfaction 1	Satisfaction 2	Satisfaction 3	Earnings
Education	9.936 years	3.487	1.000	-	-	-	-	-	-
Experience	6.45 years	4.66	-.249**	1.000	-	-	-	-	-
Hours worked	10.7 hours per day	1.95	.019	.072	1.000	-	-	-	-
Satisfaction 1	2.24	.902	-.099 [^]	.159**	-.007	1.000	-	-	-
Satisfaction 2	2.26	.915	-.108 [^]	.192**	.023	.776***	1.000	-	-
Satisfaction 3	2.26	.900	-.047	.211**	.025	.846***	.907**	1.000	-
Earnings	R351.58 per day	275.84	.169**	.105 [^]	.037	.211**	.200***	.202***	1.0000

Source: Author's analysis

These bivariate results support the predictions of human capital theory (Becker, 1964). This is a relationship typical across different sectors (Becker, 1964). However, other dimensions of human capital investments do not seem to attain a return in this context; effort invested in terms of hours worked per day seems to have no significant association with gross earnings. Individuals who are more dissatisfied with continuing in street trading are found to earn significantly less.

TABLE 2: Mean, Median, Standard Deviation and Variance Statistics

	<i>Mean</i>	<i>Median</i>	<i>Standard Deviation</i>	<i>Variance</i>
Earnings	351.58	230	275.84	76089.54
Age	34.14	32	10.27	105.39
Initial Investment	1179.41	650	1284.92	1651019
Experience	6.45	5	4.66	21.71
Continuance Satisfaction	6.77	8	2.57	6.58
Hours worked per day	10.7	11	1.95	3.82
Education	9.94	11	3.49	12.16

Source: Author's analysis

7.3 Multivariate Analysis

Hypothesis 1: There is a significant association between education and earnings

To test hypothesis 1, a Mincerian model was first modified to take the following form, to include the effects of gender, age, initial investment, experience continuance satisfaction and hours worked per day as covariates.

$$\ln \text{Earn} = \alpha + \beta_1 \text{Ed} + \beta_2 \text{Gen} + \beta_3 \text{Age} + \beta_4 \text{Init} + \beta_5 \text{Exp} + \beta_6 \text{CSat} + \beta_7 \text{Hrs} + \beta_8 \text{Ed}^2 \quad (1)$$

In this model, α represents the intercept, $\ln \text{Earn}$ the natural log of earnings, Ed years of education, Gen a dummy variable for gender, Age in years, Init the initial investment of a street trader at start-up, CSat the satisfaction of a street trader with continuing in the sector, Hrs hours worked per day, and Ed^2 the squared term of education. The CSat variable was tested as a latent variable comprising the aggregate of three subordinate items. First, a model was run which included only the education squared term as well as the education term. The VIF/Tolerance values for total education and its squared term were both 13.03/.077 when tested together with no other variables in the equation. This result was taken to suggest that multicollinearity was present. Neither education nor education squared was significant in this model. The model was run using bootstrapped standard errors and 5000 iterations, with no change evident. All subsequent models were run with bootstrapped standard errors. A model was then run with the covariates only, which returned an R-squared value of .1733 and an adjusted R-squared value of .1566. When years of education was added to the covariates and the model was run again, the R-squared value was .186 and the adjusted R-squared .1667. Replacing years of education with its squared term, the R-squared value (.1851) and adjusted R-squared (.1657) values were found to be marginally lower than when years of education was the additional variable. A model was therefore tested that included years of education together with all the covariates, without the education squared

term. With regard to literacy, numeracy and the basic skills (Becker, 1964) that education may provide to a street trader that may contribute to improved earnings, the testing of a ‘simple’ linear relationship between education and earnings was taken to be consistent with the theory in general, and this model was deemed acceptable for testing.

TABLE 3: The Regression Results: Covariates Included

<i>Number of obs</i>						303
Replications						5000
Wald chi ² (7)						86.48
Prob > chi ²						0
R-squared						0.186
Adj R-squared						0.1667
Root MSE						0.7544
	Observed	Bootstrap			Normal-based	
InEarn (Dependent Variable)	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
Variables						
Gen	0.29707	0.094129	3.16	0.002	.112581	.481558
Age	-0.00402	0.005947	-0.68	0.499	-.015676	.007635
Init	0.000155	3.99E-05	3.88	0.000	.0000766	.000233
Exp	0.029699	0.013238	2.24	0.025	.0037522	.0556459
CSat	0.060475	0.01642	3.68	0.000	.028292	.0926573
Hwpd	0.020447	0.0219	0.93	0.350	-.022476	.0633695
Ed	0.028987	0.014422	2.01	0.044	.0007216	.0572533
_cons	4.206368	0.365043	11.52	0.000	3.490898	4.921839

Source: Author’s analysis

According to these results (TABLE 3), years of education are significantly and positively associated with earnings of street traders, over and above the effects of the covariates included in the model.

As discussed previously, this relationship is also significant according to the bivariate tests (TABLE 1). On the basis of these results the null hypothesis is rejected and the alternative hypothesis is accepted. This supports the central tenets of human capital theory (Becker, 1964), which predict that learning investments in schooling such as those related to literacy and numeracy can differentiate street trader productivity, or earnings, in this context. However, what are still not understood are the mediation mechanisms of how these investments are enabled through engagement facilitated through the paths of continuance satisfaction or effort applied in the sector, proxied by hours worked per day, or though learning that accumulates with experience. The testing of the hypotheses that relate to these aspects is now reported and discussed in the sections that follow.

TABLE 4: Results of Hypothesis Testing

<i>Proposed Hypothesis</i>	<i>Hypothesis</i>	<i>Rejected or Accepted</i>
Education is significantly associated with Earnings	H1	Null rejected
Satisfaction mediates the association between Education and Earnings	H2	Null accepted
Experience mediates the association between Education and Earnings	H3	Null accepted
Hours worked mediates the association between Education and Earnings	H4	Null accepted

Source: Author's analysis

Hypothesis 2: Satisfaction mediates the relationship between education and earnings

Tests of mediation (Baron and Kenny, 1986) were performed. The potential role of satisfaction as a mediator of the influence of education on earnings was tested, using Baron and Kenny's (1986) three steps. Firstly, satisfaction was regressed on the independent variable, education. This association was significant ($\beta = -.091; p < .021$). Secondly, the dependent variable, earnings, was regressed on the independent variable, education. This association was also significant ($\beta = 11.021; p < .019$). Finally, the dependent variable, earnings, was regressed on both the independent variable and the mediator. These associations were also significant ($\beta = 13.24; p < .001$ for Education and $\beta = 24.33; p < .001$ for Satisfaction).

The mediation relationship was assessed on the basis of three requirements (Baron and Kenny, 1986): (i) that the independent variable is significantly associated with the mediator in the first step; (ii) that the independent variable is significantly associated with the dependent variable in the second step; (iii) that the mediator is significantly associated with the dependent variable in the third step; and (iv) the size of the association for the independent variable in the third step is less than the association found in the second step. The size of the association for Education is larger in the third step, however, than in the second step.

When correlation between the independent variable and the moderator is expected, on substantive grounds, and when potential multicollinearity is present, reduced power in the third step is, however, possible (Baron and Kenny, 1986); the absolute size of the coefficients therefore also needs to be taken into account, as well as the significance of the associations. Sobel's (1982) significance test was used to test the indirect effect of education on earnings through the mediator effect of satisfaction. According to this calculation, a is the path from education to satisfaction (its standard error is s_a), b is the path from satisfaction to earnings (its standard error is s_b). Assuming multivariate normality for the standard error of ab , the formula is (Baron and Kenny; 1986:1177):

$$\sqrt{b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2}$$

The Sobel test statistic for the mediator role of satisfaction on the relationship between education and earnings (Sobel, 1982) is -1.876 ($p < .03$ one-tailed probability; $p < .06$ two-tailed probability). Satisfaction was therefore found to not mediate the association between education

and earnings in this context. The null hypothesis was accepted and the alternative hypothesis was accepted.

These results were taken to support the decision to accept the null hypothesis and reject the alternative hypothesis. General human capital, or schooling, does not seem to transmit to earnings in this context through the mechanism of intrinsic continuance satisfaction.

Hypothesis 3: Experience (specific human capital) mediates the relationship between education (general human capital) and earnings

Tests of mediation (Baron and Kenny, 1986) were again performed, this time with years of education as the independent variable, experience as the mediator, and earnings as the dependent variable. Experience was regressed on the independent variable, education; this association was significant ($\beta = -.392$; $p < .001$). The dependent variable, earnings, was regressed on the independent variable, education ($\beta = 11.021$; $p < .019$). Finally, the dependent variable, earnings, was regressed on both the independent variable and the mediator ($\beta = 13.004$; $p < .001$ for Education and $\beta = 5.059$; $p < .155$ for Experience).

According to these results, experience was taken to not mediate the relationship between education and earnings. It is noted, however, that it might be possible that education mediates the role of experience on earnings. Although an individual's endowment of education typically precedes entry into the sector (and the tested model is based on this rationale), it is acknowledged that the effects of education may remain with an individual, and that it is possible that the influence of years of experience in the sector (specific human capital) on earnings might be mediated by years of general education experience (general human capital). However, this potentiality is left to further research, as the investigation of the mediating role of education, as interesting as it is, is beyond the scope of this study. Having not met the requirements for mediation, the null hypothesis is accepted and the alternative hypothesis is rejected.

Hypothesis 4: Hours worked per day mediates the relationship between education and earnings

The potential role of hours worked per day as a mediator of the influence of education on earnings was tested, using Baron and Kenny's (1986) three steps. Firstly, hours worked were regressed on the independent variable, education. This association was not significant ($\beta = -.004$; $p < .896$). Secondly, the dependent variable, earnings, was regressed on the independent variable, education. As previously reported, this association was also significant ($\beta = 11.021$; $p < .019$). Finally, the dependent variable, earnings, was regressed on both the independent variable and the mediator ($\beta = 11.044$; $p < .015$ for education and $\beta = 5.437$; $p < .501$ for satisfaction); only education was found to be significantly associated with earnings in this equation. Hours worked per day are not found to mediate the relationship between years of education and earnings of street traders in this context. The null hypothesis is accepted and the alternative hypothesis was rejected. The transmission of general human capital in the form of schooling breaks down in this tested mediated relationship when hours of effort invested do not differentiate traders by earnings. This is also taken to be an atypical relationship; more hours worked per day are not associated with higher earnings. It is also possible, however, that enough traders who earn more work fewer hours.

8. DISCUSSION

The primary aim of this research was to test the extent to which the association between school education and street trader earnings is mediated by continuance satisfaction, experience and effort invested though hours worked per day.

Although education in the form of schooling was found to be significantly associated with street trader earnings, it is concluded that the mediation mechanisms through which schooling transmits to street traders in this context seems to be independent of intrinsic satisfaction, specific human capital in the form of experience and effort invested in the form of hours worked per day.

Notably, specific human capital in the form of experience was not found to mediate the relationship between general human capital and earnings. These findings suggest that explicit knowledge, or general human capital, may have more of an influence on street trader earnings than tacit knowledge, or specific human capital in this context. It is argued that this contests the predictions of human capital theory (Becker, 1964), and other predictions that tacit knowledge (experience in the street trading context related to learning by doing and proxied by experience) is expected to have a stronger relationship with productivity (and therefore street trader earnings) than explicit knowledge in the form of schooling (Nonaka, 1994). It is possible, however, that street trader activities are at a 'tipping point' of productivity, where financial earnings are relatively more elastic in relation to differences in schooling than they are in relation to practical experience in the sector. It is possible that much of the dysfunctionality inherent in the sector may relate to low levels of schooling, which in turn is expected to be reflected in relatively low levels of literacy and numeracy. It is therefore possible that street trader productivity, or financial earnings, are more sensitive to years of schooling than to years of experience in the sector.

It is concluded that certain human capital relationships in the sector might not conform to relationships predicted by human capital theory (Becker, 1964), possibly because of the sensitivity of traders to explicit knowledge, or general human capital, and their lower levels of sensitivity to tacit knowledge, or specific human capital.

It is argued that these findings provide new insights into the nature of the dysfunctionality associated with the informal context.

There is, however, also another explanation for the 'inverse' relationship of human capital in this context: the development of tacit experience, or specific human capital, might be continually disrupted through the imposition of 'illegality' as a status on traders. This is not an explanation that is tested in this research, but merely an alternative explanation for these findings that is derived from a further analysis of the street trader literature.

According to Tissington (2009), many street traders typically choose what to sell on the basis of their ability to pick up their stock and run away from the Metropolitan Police to avoid confiscation and other consequences. It is argued that policies that seek to simply eliminate street trading might create a context where traders become 'illegal' by policy definition, and are therefore kept in a 'state of flux', where they are not able to develop typical, or 'functional' human capital relationships. It is possible that traders in this context who do not achieve stability in their operations might not earn enough to accumulate capital and develop functional human capital relationships.

Further research is recommended in order to investigate the causal mechanisms that underlie these findings, and to verify the exact extent to which dysfunctionality in the sector is primarily related to low levels of numeracy, literacy and educational human capital and ongoing disruptions of work in the sector that interfere with capital and human capital skills accumulation.

9. CONCLUSIONS

The core implication that derives from this study is that certain human capital relationships in this context seem to be atypical, or dysfunctional, and that this dysfunctionality might be related to relatively low levels of education; education may differentiate individuals according to financial earnings in the sector.

Although this study cannot ascribe causality and did not investigate ‘why’ these relationships are dysfunctional, on the basis of the literature that already exists, it was argued that a certain degree of dysfunctionality might be related to contextual influences that keep this sector in a state of flux. Furthermore, about 60% of traders in this context are of foreign origin, and many are therefore ‘illegal’ by definition.

In this context, the management of the sector through the elimination of traders from the city’s streets, however, seems to have temporarily been stalled by Constitutional Court provisions. It is recommended that transmission of general human capital, or schooling effects, to productivity, or financial earnings should be strengthened, given that this may differentiate traders in this context. An alternative policy for the management of the sector is recommended – one that provides stability and allows human capital to deepen its relationships with productivity. This might only be possible if the sector is treated as a developmental space, and individuals are empowered to develop, using the sector as a stepping-stone to entrepreneurial empowerment (De Soto, 1989). Street trader skills training is recommended, *particularly training that provides numeracy and literacy skills to traders*. It is argued on the basis of these findings that street trader earnings might be particularly sensitive to improvements in numeracy and literacy that may be associated with this type of training which is similar to schooling.

10. RECOMMENDATIONS

On the basis of these findings, is recommended that street traders are provided with training, to help them to avoid creating certain negative externalities that may provoke negative responses from other stakeholders. This is also a form of explicit learning, which when coupled with numeracy and literacy training may contribute to the functionality of the sector.

It is argued here that developmental approaches such as training and enablement policies that help individuals to attain functionality, or functional working effects, may be more effective in improving the ways traders operate, and empower them to improve the standards of their management of their enterprises and working spaces. A punitive approach, or attempts to simply remove traders, may result in disproportionate levels of human suffering and may simply displace the problem. It is argued, on the basis of these results, that it is possible that a ‘punitive’ approach may simply constrain the mediation effects of specific human capital, or context-specific learning that contributes to productivity.

Further, it is seemingly not clear what the externalities of street trading really are. The consequences of Operation Clean Sweep, which may remain a City of Johannesburg policy going forward, notwithstanding the Constitutional Court ruling, should be researched more extensively; on the basis of these results, it is suggested that policy interventions should attempt to improve the fundamental functionality of the sector.

The impact of academic research on policy in this context might, however, be limited. The attempts by the City to eradicate street trading follow similar actions in neighbouring countries. Nonetheless, the human costs of sudden interventions such as those witnessed in Operation Clean Sweep cannot be ignored without calls for policy to be based instead on well-thought-through and well-researched policy actions.

Another recommendation relates to future research. Given the difficulty of obtaining data in the street trading context, causal research techniques are recommended. This may require large budgets, as quasi-experimental and experimental research is needed in order to validate the causal mechanisms that underlie these findings, and to ensure the absence of endogeneity and heterogeneity effects. Large budgets might also allow for panel data sets to be developed, and for longitudinal research designs that better manage endogeneity and allow for causal estimation. It is a limitation of this type of research that it can only claim tests of theory and cannot make causal claims due to its reliance on associative statistics. Nevertheless, it is argued that the findings of this research are important because they offer a first study of these relationships, and offer further researchers the opportunity to build on this work. Given the lack of consensus relating to the potential of the informal sector, it is recommended that policy makers and their potential partners allocate resources to support large-scale causal research in the sector. It is argued that such costs cannot compare to the human and financial costs of policies in the sector that are not backed by causal evidence.

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