RMIT UNIVERSITY

Access to Higher Education: Does Distance Impact Students' Intentions to Attend University?

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Contents

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Executive Summary

The purpose of this study was to investigate if, net of other factors, distance is a predictor of students' intentions to attend university. This report contributes to the existing literature in a number of ways:

- In Phase One, internet-based mapping software is used to create a continuous measure (e.g. kilometres) of students' distance from a university as opposed to a relatively limited number of discrete categories (e.g. metro, remote). Continuous measures may increase understanding of how factors, such as geographical location, impact participation and access to higher education.

- In Phase Two, the Longitudinal Surveys of Australian Youth (LSAY) data indicated that geographical location in Australia significantly predicts students' intentions to attend university. Provincial students were significantly less likely to report intent to study at university when compared to metropolitan students. Moreover, remote students were even less significantly likely to report an intention to go to university as students in the metro category. As distance increases, the likelihood of students reporting intent to study at university decreases.

Students from regional and rural Australia face a number of barriers preventing them from accessing higher education. Discussed below, these commonly include economic, information, class and geographic barriers. Increased access to higher education in regional and rural Australia is one component of a multi-faceted approach to tackling the barriers that commonly impact students' participation.

1. Introduction

The purpose of the study reported here was to investigate if, net of other factors, distance is a predictor of students' intentions to attend university. We know that geography matters in relation to participation in higher education. Both the Bradley Review (Commonwealth of Australia, 2008) and the Inquiry into the Extent and Nature of Disadvantage and Inequity in Rural and Regional Victoria (Victoria Parliament Rural and Regional Committee, 2010), observed that regional students were under-represented in higher education when compared to their urban peers. Indeed, data from the Department of Education Employment and Workplace Relations (2010) show that the participation rates of students from regional and remote areas actually deteriorated between 2005 and 2010.

While we know that geography is linked to disadvantage, we do not fully understand the processes through which this disadvantage arises. The reasons for the differences in participation highlighted in both the Bradley Review and the Inquiry into the Extent and Nature of Disadvantage and Inequity in Rural and Regional Victoria varied (noted below) pointing to a complexity of factors, operating in interconnected ways. Context is critical. For example, Alloway and Dalley-Trim (2009) reported that while youth living in rural areas were commonly interested in pursuing higher education following completion of secondary school, barriers to participation limited their propensity to act on this interest. The barriers include attachment to home, desire to remain close to family and friends and the cost of studying away from home (Alloway & Dalley-Trim, 2009). In a similar refrain, Marks et al. (2000) found attitudes, motivations and aspirations as important influences in the decision to attend university. These non-cognitive dispositions towards participating in university are developed and influenced by local social and cultural networks and values. Indeed, "aspirations for higher education ... are influenced by a subtle web of interwoven characteristics including the collective values of the local community culture" (James et al., 1999, p. i & ii).

In part, the lower aspirations that are identified in some of the research as a barrier to participation could be a result of rural and remote students (and/or their teachers) understanding the difficulties they face attending higher education and, as a result, lowering their expectations of their achievement. Whatever the case, the evidence is conclusive: students living in rural and remote areas perform less well in secondary education and, even after accounting for this lower success in school, they are less likely to progress to university than their metropolitan peers.

As noted above, one challenge identifying the mechanisms through which this disadvantage develops is that the barriers to progression are likely to vary, and they are likely to change over time and space. In this respect, we know from research in vocational education in Australia, that some groups of people suffer from multiple barriers to progression in education and the labour market (McVicar & Tabasso, 2016). McVicar and Tabasso's (2016) research addresses the accumulative effect of students from poorer backgrounds, and from regional areas, and a non-dominant ethnic that helps explain their difficulties progressing in VET. Similar observations apply to participation in higher education (James et al., 1999; Parker et al., 2013).

This report aims to assess if geographical location and other background factors linked to achievement (such as socio-economic status [SES]) predict students' intentions to enrol in higher education. The research attempts to answer two key questions:

- Is distance from a university, net of other factors, a predictor of students' intentions to attend university?

- What are the implications of this study in relation to policies regarding the presence of regional universities in Australia?

The research involves two distinct phases of analysis. Phase One draws upon data gathered in a related project (Cooper, Forthcoming) and uses mapping software to create a continuous measure (e.g. kilometres) of students' distance from a university as opposed to a relatively limited number of discrete categories (e.g. metro, remote). Continuous measures may increase understanding of how factors, such as geographical location, impact participation and access to higher education. In Phase Two, we explore the same issue with the Longitudinal Surveys of Australian Youth (LSAY) data from the 2009 (Yr09) cohort (Department of Education and Training, 2016a).

Phase One of the study is underpinned by the Theory of Planned Behaviour (TPB) (Ajzen, 1991) and draws upon data gathered on 252 senior secondary students in 2015. There is evidence to suggest that behavioural intention, as it is defined in this research, is a reliable indicator of future behaviour (Freeney & O'Connell, 2012; Taylor, 2015). The TPB measures (attitude, subjective norm, perceived behavioural control) are used as formative constructs of students' intentions to attend university. Added to this modelling are a number of measures used to indicate students' distance from a university. Using Google Maps, the study is innovative because it uses mapping-software to generate a continuous measure of students' distance from a university. However, as discussed later, there are a number of limitations with this dataset that mean the study remains explorative and indicative, rather than definitive.

In Phase Two we draw upon data gathered in the LSAY to investigate if distance is a predictor of students' intentions to attend university, net of selected demographic and psychosocial variables elicited in the LSAY including for example, SES, attitude to school and normative influences. The report is divided into five key sections. Following this introduction, section two briefly reviews some of the existing literature. Section three and four describe the method and results of each phase. The final section concludes with a discussion and implications of the findings.

2. Background to the Research

There is extensive literature that examines the relationship between geography (and other factors) and participation in higher education. This literature firmly establishes that students from rural and remote areas have lower levels of participation in higher education (Marks et al, 2000; James et al. 2008; NSW Department of Education and Communities, 2013). Factors related to lower levels of participation that were identified in (James, 2008) the review of the literature include the following:

- distance from a university campus
- the generally lower SES of people living in rural and remote areas compared to those living in metropolitan areas
- lower aspirations and attitudes of people living in rural and remote areas compared to those living in metropolitan areas
- lower levels of Year 12 completion in rural and remote areas compared to those living in metropolitan areas
- the cost of attending higher education for people living in rural and remote areas compared to those living in metropolitan areas.

It is important to note that the participation of students in higher education within large metropolitan areas is also stratified by geography. For example, using On Track data, Edwards and Marks (2008) examined university participation rates in Melbourne. They found considerable differences in the university transition rates of Year 12 students from inner-metropolitan and outer-metropolitan regions, in the favour of those residing in inner-metropolitan areas. For example, almost 70 per cent of the On Track Inner Eastern Melbourne Year 12 cohort articulated to university in 2007. By way of contrast, the figure for the North West and Outer East areas was below 50 per cent (Edwards & Marks, 2008).

More recently, research specifically on the Hume district (Hume Regional Development Australia, 2012) confirmed the picture presented in James et al's (2008) research. This research identified four broad barriers to progression which were found to limit the ability of students to convert their aspirations into enrolments. These resonate with the wider literature and are:

- economic barriers – both in terms of lower household income and higher costs of regional students relocating to study
- geographic barriers – some participants indicated that they were not prepared to engage in higher education in metropolitan settings based on personal preference and comfort with regional/rural living
- informational barriers – some participants indicated that they found accessing information about higher education difficult and found navigation of application processes alien and difficult
- 'class' barriers – participants from low-SES backgrounds indicated that a lack of family background or familiarity with higher education was a potential barrier to participation (p.11).

There is much focus in the literature on the impact of aspiration on participation in university. Many studies have found students from rural and remote areas to have lower aspirations to attend university than students from metropolitan areas (James et al, 1999). The overall sentiment in the literature is that aspiration is mediated by a range of factors, including family background, access to financial support for university study, geography and school-specific factors (Parker et al., 2013). The Hume research went further, stressing that aspiration to attend university was not itself the problem. '[R] rather, there appears to be a problem with conversion of this aspiration to active participation' (Hume Regional Development Australia, 2012, p.11).

The research literature also indicates that concerns around access to higher education for students living in rural and remote areas should be expanded to include questions about access to particular programs of study. In this respect, Blakers et. al. (2003) reported that the majority of students in rural and remote areas who decide to move to attend university did so in order to access a particular program at a particular university. This suggests that a regional network of university campuses may only offer a partial solution to the problem. Even if a student lives close to a provider, if that institution does not offer the program of study the student desires, barriers to access remain. In a similar refrain, students may be forced to consider a more restricted range of programs simply because these are offered at the nearest university, even if the options available do not match their desires or capabilities. More generally, we know that students from poorer backgrounds are both less likely to attend university than their advantaged peers and they are less likely to be found in GO8 universities. In addition, they are less likely to be found in the professional fields of study for which there is the most competitive entry and in postgraduate education (James, 2008). This suggests that increasing participation is only part of the solution – focus also needs to be given to programs of study disadvantaged students complete and the universities they attend.

A number of studies have attempted to identify how significant given barriers (such as SES) are in mediating students' decisions to attend university. Evidence from Canada, for example, which is similar to Australia in many respects (e.g. large geographical surface area, developed western country), indicates that after accounting for family income, parents' education and gender, students ≥80km (straight line) from a university are 42 per cent less likely to attend university compared to students living ≤40km (Frenette, 2005). Research on the Australian case indicates that along with SES status, geographical location and distance from a university is related to students' reported aspirations to study at university. For example, James et al's (1999) study of 7000 students in three states concluded that student attitudes to participation are shaped by (in descending order of influence):

- family socio-economic background
- whether students are living in urban or rural communities
- the distance from home to the nearest campus.

In addition James et al found that "[o]n average, rural students, especially those from lower socioeconomic backgrounds, are significantly less likely than urban students to believe that:

- A university course would offer them the chance of an interesting and rewarding career.
- Their parents want them to do a university course.

Also, rural students are significantly more likely than urban students to believe that:

- A university qualification is not necessary for the jobs they want.
- Their families cannot afford the costs of supporting them at university.
- The cost of university fees may stop them attending.
- "There is no point in their going to university" (pp. xv & xvi).

Alloway and Dalley-Trim (2009) found that students reported a reluctance to become over-reliant on their parents. Thus, cost considerations influenced the students' decision to participate in higher education. However, all researchers acknowledge that the issues are complex and interrelated: poor families living in regional or remote areas are less likely to be in a position to support young people to attend university than those living in metropolitan areas. In this respect, geography is likely to exacerbate the impact of background factors known to reduce participation in higher education generally. For example, James (2001) argues that rural and regional students are more likely to perceive 'discouraging' barriers such as participation costs and they are less likely to experience 'encouraging' factors. In turn, this is likely to lower student aspirations to remain on in education to

gain a competitive ATAR and to leave home to attend university. Indeed, the literature clearly shows that students living in rural and remote areas do not achieve as highly as those living in metropolitan areas. For example, the Victorian Government (2014) demonstrated significant differences between Year 12 retention rates in metropolitan and non-metropolitan regions. Other researchers report similar findings (Lamb, Glover & Walstab, 2016).

3. Phase One

One approach to understand the drivers behind students' intentions to attend university is with the use of a theoretical behavioural framework. A prominent psychosocial behavioural framework is the Theory of Planned Behaviour (TPB) (Ajzen, 1991). This framework posits that one's intention is a direct antecedent of behaviour. Intentions are assumed to "…capture the motivational factors that influence a behaviour, they are indicators of how hard people are willing to try, of how much effort they are planning to exert, in order to perform the behaviour" (Ajzen, 1991, p. 181). One's behavioural intention is accepted as a salient variable determining how they behave.

The TPB is a model that attempts to predict and explain underlying beliefs and intentions of what motivate such behaviour (Ajzen, 2005). According to this model, intention is formed by a number of beliefs representing the perceptions that people have about a behaviour including the likely consequences of the behaviour, the normative expectations of others about the behaviour, and the likely barriers of performing a particular behaviour (Ajzen, 2005; Fishbein & Cappella, 2006; Kautonen, Gelderen & Tornikoski, 2013). As noted, the TPB has been widely accepted as a robust predictor of intention and subsequent behaviour (Azjen, 2014; Armitage & Connor, 2002), and has been utilised in a wide range of contexts to predict behaviour and intentions. While its use in education is more limited, there is research that indicates that the TPB is helpful for explaining students' educational outcomes. For example, with the aid of the TPB, Freeney and O'Connell (2012) studied the intentions of Irish high school students to leave school early. Their analysis indicated that attitude, in addition to parents' and teachers' subjective norms, were crucial determinants of students' intentions to remain in school. Similarly, Taylor (2015) used the TPB to explain students' subject choices in senior secondary schools. Taylor's study showed that the TPB constructs explained between 66 per cent and 68 per cent of the variance in intentions (Taylor, 2015).

The TPB is represented in the following figure:

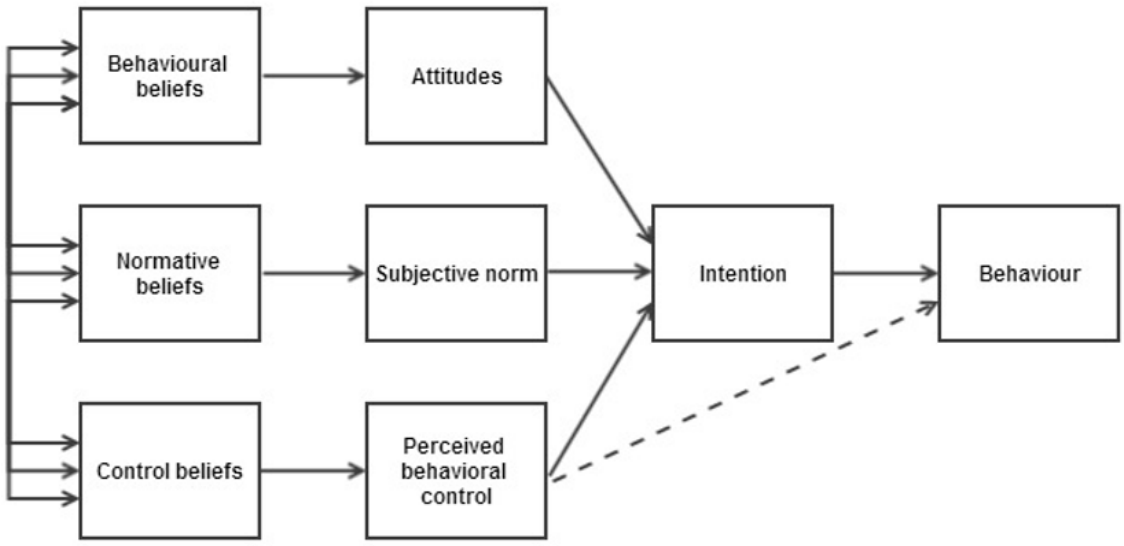


Figure 1. Theory of Planned Behaviour (Ajzen, 1991)

Table 1

Constructs in the research model and their Operational Definitions

Item	Operational definition
Intention	Students' intentions to enrol in a university degree course
Attitude	Students' positive or negative evaluation of enrolling in a university degree course
Subjective Norm	Students' perceptions of the social pressure from significant others to enrol in a university degree course
Perceived Behavioural Control (PBC)	Students' beliefs about the presence of factors that may facilitate or impede enrolment in a university degree course

Phase One of this study is underpinned by the TPB (Ajzen, 1991) and draws upon data gathered on 252 senior secondary students in 2015. The TPB measures (attitude, subjective norm, perceived behavioural control) are used as predictors of students' intentions to attend university. To test for relationships between geographical location and intention to enrol in higher education, we developed a model of TPB that included a number of variables indicating students' distance from a university. Table 1 reports the operational definitions of the dependent variable (intention) along with independent variables used in the upcoming modelling.

Intention-based models examining non-compulsory education participation have been used in other studies including Taylor (2015) and Freeny & O'Connell (2012), yet the authors are unaware of any study that has used a continuous measure of geographical location as a predictor of students' intentions to enrol in university. Using web-mapping software available in Google Maps and individual level data, the study examines if distance is a predictor of students' intentions to attend university, net of other factors.

To control for the possible effect of SES, two indicators were elicited and included in the upcoming analysis. Parents'/guardians' reported occupations were categorised using the Australian and New Zealand Standard Classification of Occupations (ANZSCO, Commonwealth of Australia, 2013). Subsequently, ANZSCO codes were converted into the Australian Socioeconomic Index 2006 (AUSEI06, McMillan, Jones & Beavis, 2009), which is an occupational status scale ranging from zero (the lowest status) to 100 (the highest status). The largest score on the AUSEI06 from Parent one or two was selected. Parents' level of education was elicited by asking students if their parents/guardians have a degree (binary yes/no response).

Nearest University Measures (NUM)

In Phase One, students' distance from a university was conceptualised in a number of different ways because there are underlying assumptions about each way it has been measured.
For instance:

- In the 'Expansive model', the measure was calculated using Google Maps to measure the distance in kilometres (in a straight line) from students' school locations to their nearest university. Universities included in this modelling may be categorised as either regional or metropolitan and a list of institutions are reported in Appendix A.
- In the 'Metro model', distance in kilometres (in a straight line) was based on the closest city

university, as regional university campuses might not share the same profile as a city campus or offer the students' desired courses (NSW Department of Education and Communities, 2013; Department of Education and Training Victoria, 2014). Universities included in this analysis are located within 25 kilometres or less of the central business district of Melbourne in a straight line.

- Lastly, the 'RA Model' categorised students according to their Australian Standard Geographical Classification - Remoteness Area (ASGC-RA) category. The ASGC-RA (shortened to RA herein) is a geographic classification system that was developed by the Australian Bureau of Statistics (ABS), which allows comparisons between 'city' and 'country' Australia (Commonwealth of Australia, 2016). In the RA model, students were categorised as 'urban' if their school is positioned in the RA1 category and 'regional students' if their school was in located in an RA2 and RA3 area. No students in Phase One reported their school in a RA4 or RA5 area.

Internal Consistency

The survey instrument was piloted in an inner city secondary school with 66 senior secondary school students. These participants were randomly recruited with a short presentation by the researcher discussing the aims and possible benefits of participating, consent; confidentiality and privacy. Internal consistency in the piloting phase indicted Intention (α=.96), Attitude (α=.90), Subjective Norm (α=.82) and PBC (α=.71). All measures met or exceeded the minimum threshold of α= ≥.7 as suggested by Hair, Black, Babin & Anderson (2014). Following the piloting process, the final version of the instrument was deemed ready for administration (See Appendix B). Of relevance to this study includes the elicitation of demographical information/ SES indicators ([Section 1]Q. 1-Q.13), intention ([Section 2]Q. 14-18), attitude ([Section 3]Q.19-Q.22), subjective norm ([section 5] Q.33-35) and PBC ([Section 7] Q.42-Q.44). The mean average of intention, attitude, subjective norm and PBC were subsequently used in the forthcoming analysis. Sections 4, 6, 8 and 9 of the instrument were elicited constructs outside the scope of this research. For additional information on how the survey instrument was constructed, please refer to Cooper, Barkatsas and Strathdee (2016). The survey instrument was administered to randomly selected attendees of a vocational and education exhibition in Melbourne, Australia. This expo is held annually and provides an opportunity for students to explore future educational (university/non-university) and vocational pathways. A total of 252 surveys were completed.

4. Results

The following section reports participants' demographics, the geographical distribution of participants across Victoria, the distribution of participants' intentions to attend university; and hierarchical regression models predicting intentions using distance to university after controlling for known factors that are correlated with intentions (attitudes, subjective norms and perceived behaviour control).

Participants

Table 2

Demographics of Participants

	Frequency	Percentage (%)
Gender		
Male	109	43.3
Female	143	56.7
High School type		
State Government school	163	64.7
Catholic/Independent school	89	35.3
Student birthplace		
In Australia `	220	87.3
Outside Australia	32	12.7
Mother birthplace		
In Australia	190	75.4
Outside Australia	62	24.6
Father birth place		
In Australia	187	74.3
Outside Australia	65	25.7
English main language spoken at home		
Yes	216	85.7
No	36	14.3
Participants' religious affiliation		
Christian	71	28.2
Buddhism	7	2.8
Islam	19	7.5
No religion	152	60.3
Other	3	1.2
Total	252	

Phase One's sample demographics are summarised in Table 2. Age was not a consideration in this study because all participants were in Year 12 and hence, all of a similar age. When broken into gender, 43.3 per cent (n = 109) of the sample reported to be male, while 56.7 per cent indicated

female (n = 143). There were 64.7 per cent (n = 163) of the sample who reported attending a government school and 35.3 per cent (n = 89) who indicated that they attended a catholic or independent school. In terms of country of birth, 87.3 per cent (n = 220) of students were born in Australia and 12.7 per cent (n = 32) reported being born overseas. A total of 85.7 per cent (n = 216) of the sample stated they used English as their main language at home and 60.3 per cent (n = 152) of the sample reported no religious affiliation. There were 28.2 per cent (n = 71) who identified as Christian.

Descriptive Statistics

Table 3

Mean, Standard Deviations, Skewness and Kurtosis

Construct	Mean	SD	Skewness	Kurtosis
Highest parent employment	60.21	22.03	-0.078	-1.671
Mother's education	0.39	0.48	0.469	-1.794
Father's education	0.37	0.48	0.539	-1.723
Intention	5.92	1.53	-1.607	1.867
Attitude	6.12	1.22	-1.851	3.25
SN	5.46	1.36	-1.081	0.923
PBC	5.50	1.19	-1.299	2.247
Distancetouniexp	18.59	24.44	1.805	2.605
Distancetounimetro	41.75	63.16	1.718	1.656

SD=standard deviation

Table 3 lists the descriptive statistics for the constructs used in the upcoming analysis. The skewness for a normal distribution is zero, and any symmetric data should have skewness near zero. Hair, Black, Babin & Anderson (2014) stated that skewness scores outside ±1 demonstrate skewed distributions while kurtosis values ±0 denote departures from normality. Attempts to normalise data and subsequent implications are discussed soon.

Geographical Distribution

Table 4

Distribution of Sample

ASGC-RA Classification	Number of Participants (%)	Victorian Population %
RA1 - Major Cities of Australia	185 (73.7%)	77.80%
RA2 - Inner Regional Australia	49 (19.5%)	18.30%
RA3 - Outer Regional Australia	17 (6.8%)	3.80%
RA4 - Remote Australia	0 (0.0%)	0.01%
RA5 - Very Remote Australia	N/A* (0%)	0%
Total	252 (100%)	100.00%

**Note: There are no RA5 areas in the state of Victoria*

Students reported being enrolled in different high school regions across Victoria. The distribution of students' high schools and their ASGC-RA rank are reported in Table 4. From the ASGC-RA ranking,

73.7 per cent of students reported their enrolment in a school located in a Major Cities of Australia area (e.g. Footscray, Toorak and Broadmeadows, n = 185). There were 49 (19.5 per cent) students who reported their enrolment in a school located in the Inner Regional Australia zone (e.g. Ballarat, Echuca, Sale). A total of 6.8 per cent of students reported their enrolment in a school (n = 17) located in Outer Regional Australia. Compared to the population percentages of year 12 students in Victoria (Department of Education and Training Victoria, 2016b), the sample's distribution was comparable across the remote area index measure.

Reported Intentions of Students

Table 5

Students' intentions according to Remote Area Index

ASGC-RA Classification	Mean Intention	SD	95% CI	n
RA1 - Major Cities of Australia	5.92	1.57	5.70-6.15	185
RA2 - Inner Regional Australia	6.06	1.28	5.70-6.43	49
RA3 - Outer Regional Australia	5.49	1.80	4.56-6.42	17

All the respondents attended the VCE expo, and perhaps therefore all had interest in further study, but not necessarily a university pathway. As shown in Table 5, students' mean intentions were categorised according to their reported remote area index. Table 5 indicates that students' average intentions to enrol at university in the sample collected were relatively similar. For instance, students from Inner Regional Australia (RA2) reported higher mean intentions than students from Major Cities of Australia (RA1). Moreover, students from Outer Regional Australia (RA3) in the sample reported a level average of 5.49 compared to the RA1 sample of 5.92. A one-way between subjects ANOVA was conducted to compare if there was a significant difference between students' mean intention according to their remote area index classification. This analysis was not statistically significant, $F(2, 248) = .86$, $p = .425$, indicating that students had relatively high levels of intention to enrol in university, irrespective of their reported geographical location. This finding is contrary to a number of previous studies using larger samples of students (Edwards & Marks, 2008; Frenette, 2005; James et al., 1999) and enrolment data (Lamb, Jackson, Walstab & Huo, 2015). Consequently, the non-significant differences between students' intentions in different RA categories is an important consideration and potential limitation of the dataset because it suggests that there was bias within the sample. If there was bias, the effect of distance to university on students' intentions to enrol in university may not reveal itself.

Hierarchical Multiple Regression Analysis

The aim of this report is to investigate if distance is a predictor of students' university intentions, net of other factors. In order to do this, Hierarchal Multiple Regression (HMR) was used to predict students' intentions to enrol in university, after controlling for the combined effect of factors purported to impact university intentions identified in previous work (Cooper, Barkatsas & Strathdee, 2016). HMR involves building successive linear regression models, each adding more predictors one at a time, and noting how the addition of each set of variables change the model fit and the regression parameters. By adding sets of variables in stages, researchers can understand how each set of variables contributes to or impacts the regression model. The order in which sets of variables are added is controlled carefully by the researcher and is usually guided by previous research or theory.

HMR has the same assumptions as ordinary multiple regression. The major assumptions of multiple regression include independence, normality of residuals, homoscedasticity and linearity. The assumption of independence was assumed as each questionnaire was completed by an individual

student, and the relationship between participants was unknown. In order to check the other three assumptions, each regression model's diagnostic plots were visually inspected (see Appendix C). As discussed in later sections, there were issues identified with residuals that do require these models to be interpreted with some caution.

As discussed, students' distance from a university has been conceptualised in a number of different ways based on various assumptions (see Nearest University Measures, p. 12). In the 'Expansive Model' below, the NUM measure was calculated using Google Maps to measure the distance in kilometres from students' school locations to their nearest university. Universities included in this modelling may be categorised as either regional or metropolitan and a list of institutions are reported in Appendix A.

Expansive Model

Table 6

Summary of Hierarchical Regression Analysis for Variables Predicting Students' Intentions

Variable	B	SE	β	t	R^2	Adjusted R^2
Block 1					.005	.001
Distancetouniexp	-.005	.004	-.073	-1.158		
Block 2					.11	.09
Distancetouniexp	-.004	.004	-0.070	-1.130		
Highest parent employment	.011	.007	.161	1.615		
Mother's education	.317	.240	.101	1.319		
Father's education	.371	.272	.117	1.365		
Block 3					.72	.71
Distancetouniexp	-.001	.002	-.018	-.536		
Highest parent employment	-.003	.004	-.040	-.696		
Mother's education	.176	.136	.056	1.296		
Father's education	.309	.154	.097	2.00*		
Attitude	.862	.070	.684	12.36**		
Subjective norm	.183	.050	.162	3.65**		
Perceived Behavioural Control	.049	.075	.038	.649		

*Note: *p<.05 **p<.001*

Block 1

In Block 1, it was plausible that distance may affect other variables in the model (e.g. attitudes, subjective norm etc.) and hence it was added first to the hierarchal modelling. A non-significant regression equation was found, $F(1, 249) = 1.34$, p.24. In other words, the fit of the intercept-only model was not significantly reduced when compared to this model.

Block 2

In Block 2, parents' employment prestige and education were added to the modelling as indicators of SES status. Introducing these variables to the model explained 11 per cent of variation in students' intentions and this change in R^2 was significant, $F(4, 246) = 7.63$, $p < .001$.

Block 3
Finally, the addition of the Theory of Planned Behaviour (Attitude, Subjective Norm, Perceived behaviour control) variables was included in the modelling. Introducing these variables into the model explained an additional 61 per cent of the variation in students' intentions (R^2=.72 (F (7, 243) = 89.48, p <.001). In Block 3, students' attitude, subjective norm and father's education were significant predictors of students' intentions to enrol in university. Of particular relevance to this study, these results indicated, based on the sample collected, that distance from a university was not a significant predictor of students' intentions to enrol in university.

Metro Model

Table 7

Summary of Hierarchical Regression Analysis for Variables Predicting Students' Intentions

Variable	B	SE	β	t	R^2	Adjusted R^2
Block 1					.001	-.003
Distancetounimetro	-.001	.002	-.026	-.410		
Block 2					.11	.09
Distancetounimetro	-.001	.001	-.038	-.625		
Highest parent employment	.012	.007	.169	1.69		
Mother's education	.320	.241	.101	1.324		
Father's education	.349	.272	.110	1.284		
Block 3					.72	.71
Distancetouniexp	.000	.001	-.015	-.451		
Highest parent employment	-.003	.004	-.040	-.679		
Mother's education	.178	.136	.056	1.30		
Father's education	.306	.154	.096	1.98*		
Attitude	.863	.070	.685	12.38**		
Subjective norm	.183	.050	.162	3.65**		
Perceived Behavioural Control	.049	.075	.038	.653		

*Note: *p<.05 **p<.001*

Two other variations of the "distance to university" variable were also tested. The first HMR analysis based distance on the closest university to students' location from both regional and city university locations. In the 'Metro model' in Table 7, distance in kilometres was based on the closest city university, as regional university campuses might not share the same profile as a city campus (NSW Department of Education and Communities, 2013). Universities included in this analysis are reported in Appendix A. Similar to the Expansive model results, the Metro model had little impact on the results (see Table 7). These results indicate, based on the sample collected, that distance from a university was not a significant predictor of students' intentions to enrol in university, after taking into account demographics and TPB variables.

RA Model

Table 8

Summary of Hierarchical Regression Analysis for Variables Predicting Students' Intentions

Variable	B	SE	β	t	R^2	Adjusted R^2
Block 1					.000	-.004
RAcat	-.015	.221	-.004	-.066		
Block 2					.10	.09
RAcat	-.082	.211	-.024	-.390		
Highest parent employment	.012	.007	.174	1.760		
Mother's education	.315	.241	.100	1.306		
Father's education	.334	.270	.105	1.236		
Block 3					.72	.71
RAcat	-.002	.119	-.001	-.021		
Highest parent employment	-.003	.004	-.036	-.635		
Mother's education	.174	.136	.055	1.278		
Father's education	.298	.153	.094	1.94		
Attitude	.864	.070	.685	12.37**		
Subjective norm	.183	.050	.163	3.66**		
Perceived Behavioural Control	.048	.075	.038	.643		

*Note: *p<.05 **p<.001*

Lastly, the 'RA Model' categorised students into Remote Area Index categories as opposed to the previous models that used kilometre measures. In the RA model, students were categorised as 'urban' if their school is positioned in the RA1 category and 'regional students' if their school was in located in an RA2 and RA3 area. Once again, as shown in Table 8, from the sample collected, that distance from a university was not a significant predictor of students' intentions to enrol in university above and beyond TPB variables.

Limitations with this analysis

Regardless of how distance from a university was conceptualised or transformed, distance to university did not enter significantly into any of the hierarchical regression models predicting intentions to attend university, after participants' background factors and TPB factors were taken into consideration. Before drawing final conclusions, two major issues with the data and analysis must be raised. The first issue was related to the potential for sample bias, particularly in regards to the distribution of the response variable. As discussed (see p. 14), if there was bias, the effect of distance to university on students' intentions to enrol in university may not show. Moreover, as shown in Appendix C, the models suffered from non-normal residuals and evidence of heteroscedasticity. Violations to these assumptions can bias estimates of the regression model's parameters' standard errors and subsequently lead to type I errors or poor statistical power (Rosopa, Schaffer & Schroeder, 2013; Williams, Grajales & Kurkiewicz, 2013). In other words, because these assumptions were violated, the ability of the models to detect relationships may have been compromised. Statistical transformations of the data are a common strategy to deal with violations to the assumption of linear regression; however, efforts to correct these issues with the data using standard transformations (e.g. Log10, Natural log and Square root) were unsuccessful. This stemmed from the highly left skewed,

and discrete distribution of the intentions variable (see Appendix D). Transformation are most effective when performed on continuous variables. There was no way to formally test the speculated effects of violating the assumption without collecting a new sample from the population or cross-validating the findings using other datasets. Given these limitations, the researchers turned their attention to other data sources that might shed further light on the possible relationship between distance to university and students' intentions to attend. This brings us to Phase Two of the report.

5. Phase Two

The Longitudinal Surveys of Australian Youth (LSAY) was used to investigate if students' geographical classification is a predictor of their intention to attend university, net of other pertinent demographic and psychosocial variables. The LSAY surveys elicit information from students regarding their attitudes towards education and training, work, and financial matters. Various iterations of the LSAY surveys have been conducted from the mid-1970s through to the mid-1990s: including the Youth in Transition Survey (YITS); the Australian Longitudinal Survey (ALS); the Australian Youth Survey (AYS); and the current LSAY collection, which began in 1995 (Department of Education and Training, 2016a). The most recent collection of LSAY data was the 2009 (Yr09) cohort and will continue to be measured each year until 2019. The Yr09 cohort was selected for use in this study because it is the most recent collection of data in this initiative. Moreover, there is research to suggest that students' reported university intent in year nine can be a reliable predictor of actual participation. For instance, Khoo and Ainley (2005) analysed LSAY data (Yr 95) and reported that the correlation between intention to study at university in grade nine and actual participation in a degree course is moderately strong (r = .59).

Sample Characteristics (Phase Two)

Table 9

Unweighted Sample demographics in LSAY Yr09 Cohort, Wave 1

Mean age of respondents: 15.7

	Frequency	Percentage (%)
State/Territory		
New South Wales	3313	23.2
Victoria	2296	16.1
Queensland	2531	17.8
South Australia	1524	10.7
Western Australia	1486	10.4
Tasmania	1277	9
Northern Territory	788	5.5
Australian Capital Territory	1036	7.3
Sex		
Male	7020	49.3
Female	7231	50.7
Indigenous status		
Indigenous	1143	8
Non-Indigenous	13108	92
Geographic Region		
Metropolitan	9890	69.4
Provincial	3908	27.4
Remote	453	3.2
Country of birth		
Australia	12426	88.7
Other	1581	11.1
Sample Size	14251	100

As shown in Table 9, over fourteen thousand Australians participated in Wave 1 of the Yr09 LSAY. The gender distribution was approximately even with a mean age of 15.7 years. Nearly nine in every 10 participants reported their country of birth as Australia. Over 60 per cent of the cohort was enrolled in a Government school; almost 22 per cent were in the Catholic sector with the remaining enrolled in an independent school. Further information on the collection, user guides and other technical papers are available from the LSAY website (Department of Education and Training, 2016a).

Psycho-social University Intention Model

Before analysis of the LSAY data could begin, it was necessary to firstly identify variables from the LSAY dataset that may act as proxy variables for the pyscho-social variables used in this study. While this model diverges from the use of Theory of Planned Behaviour variables, there are similar constructs elicited in the LSAY dataset that were used. In the absence of continuous data, intention to study at university was determined by students' responses to the following questions: *In the year immediately after you leave school… What do you plan to do?* (St65N01). Students' responses were subsequently recoded into binary categories 'plan to go to university' or 'other'. While students' attitudes to studying at university are not explicitly measured, students were required to answer the *Index of Attitude Towards School* - ATSCHL, (Organisation for Economic Cooperation and Development [OECD], 2005) scale. The ATSCHL is derived from students' agreement with the following statements:

i. School has done little to prepare me for adult life when I leave school.
ii. School has been a waste of time.
iii. School has helped give me confidence to make decisions.
iv. School has taught me things which could be useful in a job.

The first two questions are negatively phased and were consequently inverted, meaning higher values on this index indicate a more positive perception of school. Normative influences were measured as the sum of three variables below:

i. On a scale from zero to 10 where zero means 'no influence' and 10 means 'very strong influence'; how much has your family influenced your thinking about what you would like to do in the future? (LCA040A)
ii. On a scale from zero to 10 where zero means 'no influence' and 10 means 'very strong influence'; how much have your friends influenced your thinking about what you would like to do in the future? (LCA040B)
iii. On a scale from zero to 10 where zero means 'no influence' and ten means 'very strong influence'; how much have your school teachers influenced your thinking about what you would like to do in the future? (LCA040C)

Perceptions about self and school was derived from variable LBA029E, from students' agreement with the following: 'I'm good at dealing with setbacks at school'. Although debates on how to measure SES continue, regularly measures of parents' employment, education and wealth are used to indicate students' SES status (National Centre for Vocational Education Research, 2013). In the LSAY dataset, a composite measure of SES called the Economic, Social and Cultural status (ESCS) index was adopted (OECD, 2005). The ESCS index is derived from the highest level of parents' occupations classified using the International Standard Classification of Occupations (known as the HISEI), parental education converted to years (PARED) and access to possessions at home as a surrogate measure of wealth (HOMEPOS). Further information about this measure can be found in Schulz (2005) and OECD (2005). Geographical location in the LSAY data was coded with respect to the Ministerial Council for Education, Early Childhood Development and Youth Affairs Schools Geographic Location Classification (Commonwealth of Australia, 2016):

i. Metropolitan – including mainland state capital cities or major urban districts with a population of 100,000 or more (e.g. Geelong, Hobart, Cairns)
ii. Provincial – including provincial cities and other non-remote provincial areas with an approximate population of 50,000-99,999 (e.g. Darwin, Ballarat, Tamworth)
iii. Remote – All other non-metropolitan and provincial areas including restricted accessibility of goods, services and opportunities for social interaction (e.g. Mt Isa, Port Hedland, Swansea).

Table 10

Unweighted Frequency and Percentage of Students' Geographical location in LSAY Yr09 Cohort, Wave 1

	Frequency	Percentage (%)
Metropolitan	9890	69.4
Provincial	3908	27.4
Remote	453	3.2
Total	14251	100.0

Before analysis on these data was conducted, it was important to report the percentage of students categorised in each geographical location (Table 10). As shown, nearly 70 per cent of the sample are categorised as students living in a metropolitan region. Over 27 per cent report living in a provincial area while only 3.2 per cent are living in a remote area.

Distance and Intention to study at University

Table 11

Results of Logistic Regression Predicting Students' University Intention by Distance

						95% CI		
	B	SE	Wald	df	p	OR	LB	UB
Metro*	-	-	161.67	2	<.001	-	-	-
Provincial	-.557	.050	130.49	1	<.001	.573	.521	.630
Remote	-.911	.139	42.96	1	<.001	.402	.306	.528
Constant	-.086	.024	12.68	1	<.001	.917		

*Note. SE = standard error, CI = confidence interval, LB = lower bound, UB = upper bound. *Reference category.*

Keeping in mind the focus of this report, initial modelling of geographical location as a predictor of students' intentions to study at university was conducted (see Table 11). Logistic regression was performed in order to model the likelihood that a participant plans to go to university, using 'plan to go to university' (coded as 1) or 'other' (coded as 0) as the binary dependent variable, given their categorical location as an independent variable, which was defined as metro, provincial and remote. This model was statistically significant, $\chi 2(2) = 167.789$, $p < .001$. The model explained 2.3 per cent (Nagelkerke R^2) of the variance in students' university intentions. Provincial students were statistically significantly less likely to report an intent to study at university when compared to students in the metro category (OR = .57, 95% CI .521- 630). In addition, remote students were also significantly less likely to report an intention to go to university as students in the metro category (OR = .402, 95% CI .306, .528). These results suggested that students located further from the city were less likely to report an intention to study at university. Following this analysis, the next stage was to conduct analysis on the Psycho-social University Intention Model.

Psycho-social University Intention Model

Table 12

Cases in Psycho-social University Intention Model

Variable	Valid	Missing
SES	13933	318
Attitude	13455	796
Normative Influences	5384	8867
Self/school Perceptions	8110	6141
Distance	14251	0
Included in following analysis	3997	10254

The model including distance to predict intentions included 14251 (100%) cases from the LSAY Yr09 cohort. In the following model, this number dropped to 3997 (28%) (See Table 12) due to significant missing data on a number of the key variables included. As such, the reader should keep this major limitation in mind when interrupting the following model.

Table 13

Results of Logistic Regression Predicting Students' University Intention using the Psycho-social University Intention Model

						95% CI			Nagelkerke R^2	$\chi 2$ (df)
	B	SE	Wald	df	p	OR	LB	UB		
Block 1									.009	26.086** (1)
SES	.23	.045	25.84	1	<.001**	1.26	1.15	1.37		
Block 2									.036	108.829**(3)
SES	.19	.046	16.56	1	<.001**	1.20	1.10	1.32		
Attitude	.29	.033	78.41	1	<.001**	1.34	1.26	1.43		
Normative influences	-.00	.006	.01	1	.931	.98	0.99	1.01		
Self/school perceptions	-.03	.015	3.08	1	.079	.97	.95	1.00		
Block 3									.044	134.561**(6)
SES	.15	.046	10.08	1	<.001**	1.16	1.06	1.27		
Attitude	.29	.033	78.84	1	<.001**	1.34	1.26	1.43		
Normative influences	.00	.006	.012	1	.914	1.00	.99	1.01		
Self/school perceptions	-.03	.015	3.18	1	.075	.97	.95	1.00		
Distance										
Metro1			25.34	2	<.001**					
Provincial	-.31	.077	16.36	1	<.001**	.73	.63	.85		
Remote	-.72	.212	11.42	1	<.001**	.49	.32	.74		

*Note. **Significant p<.001, SE = standard error, CI = confidence interval, LB = lower bound, UB = upper bound. 1 Reference category*

Block 1

As shown in Table 12, SES explained .9 per cent (Nagelkerke R^2) of the variance in students' university intentions and correctly classified 54 per cent of cases (relative to 52.1 per cent when no independent variables were added). These results indicate SES was a significant predictor of students' intentions to attend university. As SES increased, so too did the odds of intending to go to university (OR = 1.26, 95% CI, 1.15-1.37).

Block 2

The addition of Attitude, Normative Influences and Self/school Perceptions to SES explained 3.6 per cent (Nagelkerke R^2) of the variance in students' university intentions and correctly classified 56.5 per cent of cases (relative to 52.1 per cent when no independent variables were added). The Wald criterion demonstrated that SES and Attitude made a significant contribution ($p < .001$) to the prediction of students' intentions above and beyond SES. As SES and Attitude increased, so too did the odds of intending to go to university (Attitude: OR =1.34, 95% CI, 1.26-1.43; SES: OR =1.20, 95% CI, 1.10-1.32).

Block 3

Lastly, geographical variables were added in Block 3. The addition of these variables explained 4.4 per cent (Nagelkerke R^2) of the variance in students' university intentions and correctly classified 58 per cent of cases (relative to 52.1 per cent when no independent variables were added). Attitude (OR =1.34, 95% CI, 1.26-1.43.) and SES (OR =1.16, 95% CI, 1.06-1.27) continued to be significant predictors of students' intentions in Block 3. Holding all other variables constant, Provincial students were significantly less likely to report an intent to study at university when compared to students in the Metro category (OR = 0.73, 95% CI .631, .852). Moreover, Remote students were significantly even less likely to report an intention to go to university as students in the Metro category (OR = 0.49, 95% CI .32, .74). These results suggest that as students are located further from the city, they are less likely to report an intention to study at university.

6. Discussion

This report contributes to the existing literature in a number of ways. Within the ever growing area of geo-mapping techniques, researchers are encouraged to consider variables like the Nearest University Measure (NUM) used in this report. Continuous measures (e.g. kilometres), as opposed to discrete categories (e.g. metro, remote) may increase understanding of how factors, such as geographical location, may impact participation and access to education and other services. While the continuous measures used in Phase One did not significantly predict students' intentions to enrol at university, the high risk of sample bias and a number of statistical issues prevent clear conclusions. Future research may apply the same techniques used in Phase One on a larger, more representative sample. An ever growing list of geo-mapping techniques and software is enabling new ways for researchers to report and analyse trends, correlations and possible relationships.

In Phase Two, the LSAY data indicates that geographical location categories in Australia significantly predicts students' intentions to attend university. The Gonski Report in defining equity, emphasised the importance of working towards access to an international standard of education, regardless of where students live or the school they attend (Gonski et al., 2011). Unfortunately, distance and isolation may prevent students in regional and rural Australia from attaining a university education. As discussed earlier, barriers may include attachment to home, desire to remain close to family and friends and the cost of studying away from home (Alloway & Dalley-Trim, 2009). At a societal level, dispositions towards participating in higher education are developed and influenced by local social and cultural networks and values (Strathdee, 2005). While factors are likely to be complex and interwoven, even when controlling for the effect of SES, this report found geographical location to be a significant predictor of students' intentions to study at university. These findings are consistent other reports including Marks et al., (2000) and McVicar & Tabasso (2016). What these findings highlight is the importance of access to universities in regional and rural Australia.

Access to services is a persistent challenge in rural and regional Australia, as smaller populations make it difficult to offer the range of services (e.g. healthcare, education) that are available in metropolitan areas (Victorian Government, 2014). As a result, people either travel long distances to access such services or go without. Increased access to higher education in regional and rural Australia is one component of a multi-faceted approach to tackling the economic, information, class and geographical barriers that commonly impact students' participation. Universities in regional and rural Australia are uniquely positioned to contribute to the economic, social, cultural fabric of their region. An important element of improved access includes a regional network of universities that offer a wide range of courses that appeal to students' diverse desires and/or capabilities. Faced with ever tightening budgets, innovate solutions are urgently needed in order to improve access to university education for regional and rural Australia.

Appendix A

Universities included in the Expansive Model

Name of university	Campus
Australian Catholic University	Melbourne (St Patrick's)
Australian Catholic University	Ballarat (Aquinas)
Charles Sturt University Study Centre	Melbourne
Central Queensland University	Melbourne
Deakin	Burwood
Deakin	Warrnambool
Deakin	Waterfront
Deakin	Waurn Ponds
Federation University	Ballarat
Federation University	Gippsland
Monash University	Clayton
Monash University	Caulfield
Monash University	Peninsula
Swinburne University of Technology	Hawthorn
University of Canberra Melbourne	Melbourne
University of Melbourne	Parkville campus
University of Melbourne	Burnley
Victoria University	Footscray Park
Victoria University	Flinders Lane
Victoria University	St Albans
Victoria University	Queen street
Victoria University	Werribee
Charles Darwin	Melbourne
Latrobe University	Bundoora
Latrobe University	Albury-Wodonga
Latrobe University	Bendigo
Latrobe University	Mildura
Latrobe University	Shepparton
RMIT University	City Campus
RMIT University	Bundoora
RMIT University	Brunswick

Universities included in the Metro Model (≤ 25 kilometres [straight line] from CBD)

Metro list	Campus
Australian Catholic University	Melbourne
Charles Sturt University Study Centre	Melbourne
Central Queensland University	Melbourne
Deakin	Burwood
Monash University	Clayton
Monash University	Caulfield
Swinburne University of Technology	Hawthorn
University of Canberra Melbourne	Melbourne
University of Melbourne	Parkville campus
University of Melbourne	Burnley
Victoria University	Footscray Park
Victoria University	Flinders Lane
Victoria University	St Albans
Victoria University	Queen Street
Victoria University	Werribee
Charles Darwin	Melbourne
Latrobe University	Bundoora
RMIT University	City Campus
RMIT University	Bundoora
RMIT University	Brunswick

Appendix B

Survey instrument

RMIT UNIVERSITY

PLEASE READ THESE INSTRUCTIONS FIRST

Thank you for participating in this study. If you are taking a gap year or a break from study, this should not affect how you answer these questions. Please answer what you intend to do within the next 3 years.

A genuine intent to study at university is indicated by enrolling in a degree course. When questions in this survey ask you about studying at university, **I want you to think about your intention to enrol in a university degree course in the next 3 years**. It is important to point out that there are no right or wrong answers; I'm interested in your beliefs about your future pathway.

Section 1: Some general information about you

In this section you will be asked some questions about you, your family and your home. Some of the following questions are about your parents or people who are like your parents to you — for example, guardians, step parents, foster parents, etc. If you share your time with more than one set of parents/ guardians, please answer the following questions for those parents/guardians you spend the most time with.

Q1. Are you male or female?

□ Male □ Female

Q2. I currently attend a: (Please ask if not sure)

□ State Government school □ Catholic/Independent school

Q3. The name of the school I currently attend is:

_____

Q4. Parent 1 is □ Male / □ female.

What is **Parent 1's** main or most recent job? (e.g. School teacher, kitchen-hand, sales manager). Please write in the job title below:

Q5. Has **Parent 1** completed a degree or higher at university?

□ Yes □ No

Q6. Where was **Parent 1** born?

□ In Australia □ Outside Australia

Q7. Parent 2 is □ Male / □ female.

What is **Parent 2's** main or most recent job? (e.g. school teacher, kitchen-hand, sales manager). Please write in the job title below:

Q8. Has **Parent 2** completed a degree or higher at university?

□ Yes □ No

Q9. Where was **Parent 2** born?

□ In Australia □ Outside Australia

Q10. Where were **you** born?

□ In Australia □ Outside Australia

Q11. Is English the main language spoken in your home?

□ Yes □ No

If No, what is the main language spoken in your home?

□ Arabic
□ Mandarin
□ Italian
□ Vietnamese
□Greek
□Cantonese
□ Other (If other, please specify_____)

Q12. Do you have a religious affiliation?

□ Christian □ Buddhist □ Islam □ No religion
□ Other (If Other, please specify_____)

Q13. How many books are there in your home?

There are usually about 40 books per metre of shelving. Do not include magazines, newspapers, or your school books.

Please write number of books here: _____

Section 2 Please indicate your response to the following questions/statements:

Q. 14	I expect to study a degree at university	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.15	I want to study a degree at university	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.16	I intend to study a degree at university	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.17	I plan to study a degree at university	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.18	Studying a degree at university is something I will try and do	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

If you do intend to go to university to study a degree, **please tick the course you intend to enrol in**, otherwise tick N/A:

□ Science-related □ Engineering-related □ Management/ Business/Commerce

□ Health-related □ Humanities/Arts □ Creative Arts □ Education

□ N/A: Not intending to study a degree within next 3 years

Section 3										
Q.19	I believe studying a degree at university will be:	Bad for me	1	2	3	4	5	6	7	Good for me
Q.20	I believe studying a degree at university will be:	Useless	1	2	3	4	5	6	7	Worthwhile
Q.21	Studying a degree at university will be:	Unpleasant	1	2	3	4	5	6	7	Pleasant
Q.22	I believe studying a degree at university will be:	Unenjoyable	1	2	3	4	5	6	7	Enjoyable
Section 4										
Q.23	If I study a degree at university, I will find it easier to get a job I like	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.24	If I study a degree at university, I will get the opportunity to learn things I am interested in	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.25	If I study a degree at university, I will have more money in the future	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.26	If I study a degree at university, I will attend social events (e.g. parties/ social and special interest clubs)	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.27	If I study a degree at university, I will have a study debt	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.28	Finding a job I like is:	Extremely undesirable	-3	-2	-1	0	1	2	3	Extremely desirable
Q.29	Learning things I am interested in is:	Extremely undesirable	-3	-2	-1	0	1	2	3	Extremely desirable
Q.30	Having money is:	Extremely undesirable	-3	-2	-1	0	1	2	3	Extremely desirable
Q.31	Attending social events (e.g. parties/ social and special interest clubs) is:	Extremely undesirable	-3	-2	-1	0	1	2	3	Extremely desirable

Q.32	Having a study debt is:	Extremely undesirable	-3	-2	-1	0	1	2	3	Extremely desirable
Section 5										
Q.33	Most people who are important to me think that I:	Should not study a degree course at university	1	2	3	4	5	6	7	Should study a degree course at university
Q.34	It is expected of me to study a degree course at university	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.35	People who are important to me want me to study a degree course at university	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Section 6										
Q.36	My parents/guardians generally think I:	Should not study a degree course at university	-3	-2	-1	0	1	2	3	Should study a degree course at university
Q.37	My teachers generally think I:	Should not study a degree course at university	-3	-2	-1	0	1	2	3	Should study a degree course at university
Q.38	My friends generally would:	Disapprove of me studying a degree at university	-3	-2	-1	0	1	2	3	Approve of me studying a degree at university
Q.39	My parent's/ guardian's approval is important to me:	Not at all	1	2	3	4	5	6	7	Very much
Q.40	What teachers think I should do matters to me	Not at all	1	2	3	4	5	6	7	Very much
Q.41	What friends think I should do matters to me	Not at all	1	2	3	4	5	6	7	Very much
Section 7										
Q.42	I am confident that I could study a degree course at university if I wanted to	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

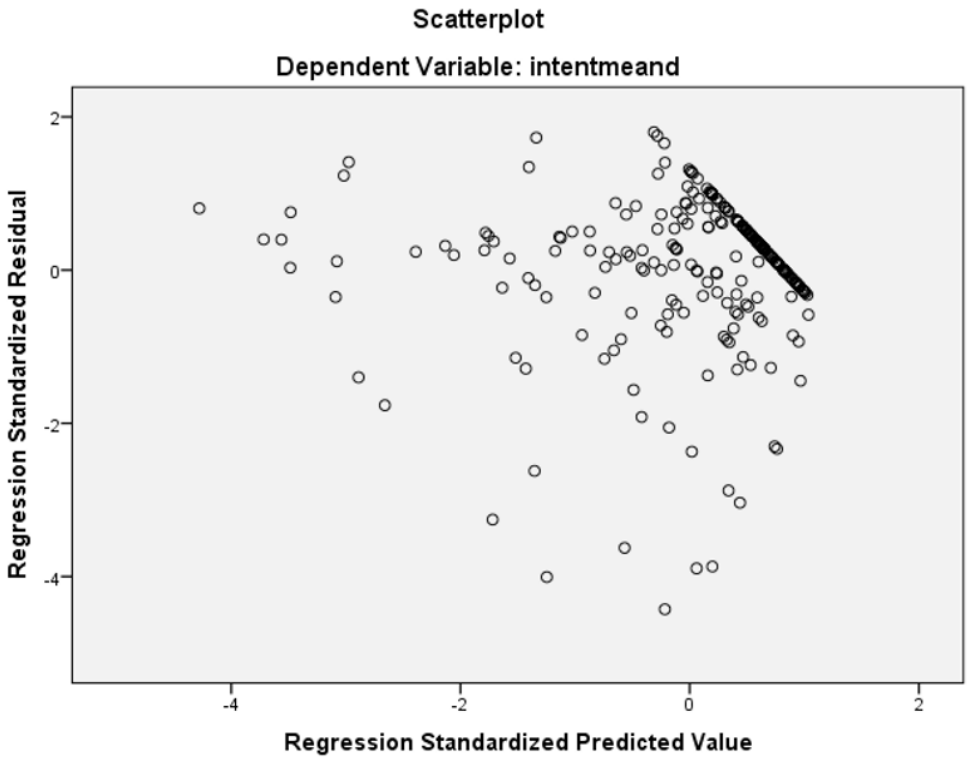
Q.43	If I wanted to, I feel in complete control of whether to study for a degree at university	Completely false	1	2	3	4	5	6	7	Completely true
Q.44	Whether I decide to study for a degree at university is entirely is up to me	Completely false	1	2	3	4	5	6	7	Completely true
Section 8	Please indicate your response to the following questions/statements:									
Q.45	Having access to enough money (e.g. savings/parent's help) is important in order to study a degree at university	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.46	My confidence in successfully passing university in the future is important in order to study a degree	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.47	Getting the final high school results needed for university entry is important in order to study a degree	Very unlikely	1	2	3	4	5	6	7	Very Likely
Q.48	My access to money (e.g. savings/parent's help) means that I am:	Less likely to study a degree at university	-3	-2	-1	0	1	2	3	More likely to study a degree at university
Q.49	My confidence in successfully passing university in the future means I am:	Less likely to study a degree	-3	-2	-1	0	1	2	3	More likely to study a degree
Q.50	The final high school results I expect to receive overall mean I am:	Less likely to study a degree at university	-3	-2	-1	0	1	2	3	More likely to study a degree at university

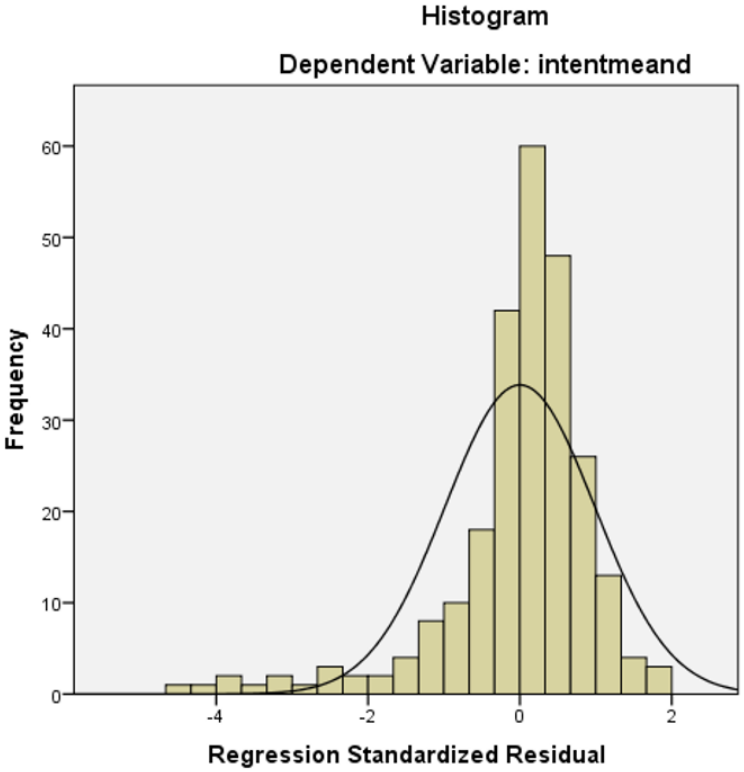
Section 9	Please indicate your response to the following questions/statements:									
Q.51	I'm good at most school subjects	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.52	I learn things quickly in most school subjects	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.53	If I work really hard, I could be one of the best students in my school year	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.54	Work in English classes is easy for me	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.55	English is one of my best subjects	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.56	I get good marks in English	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.57	I have always done well in mathematics	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
Q.58	Mathematics is one of my best subjects	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Q.59	I get good marks in mathematics	Strongly disagree	1	2	3	4	5	6	7	Strongly agree

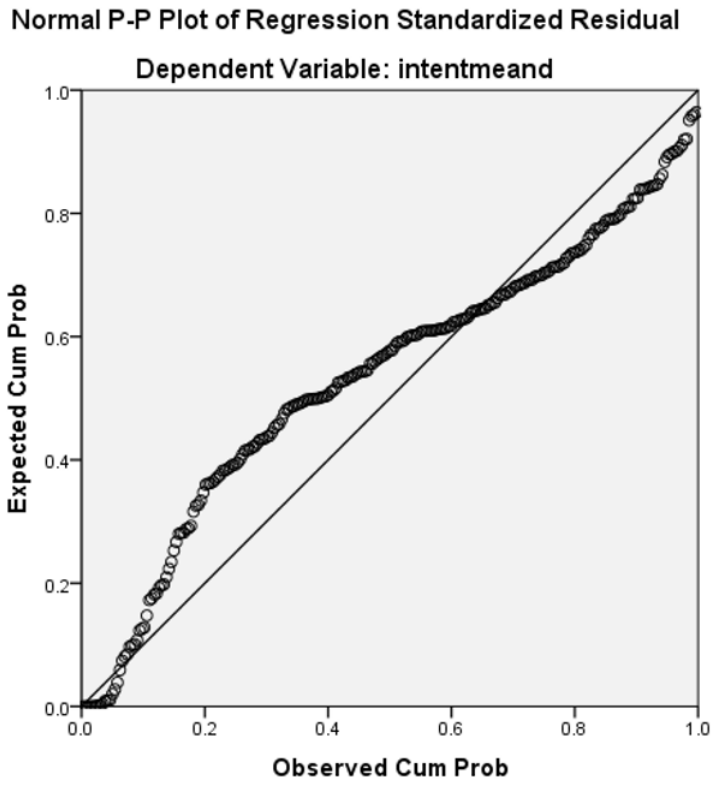
Thank you for your time and participation. Your contribution is appreciated.

Appendix C

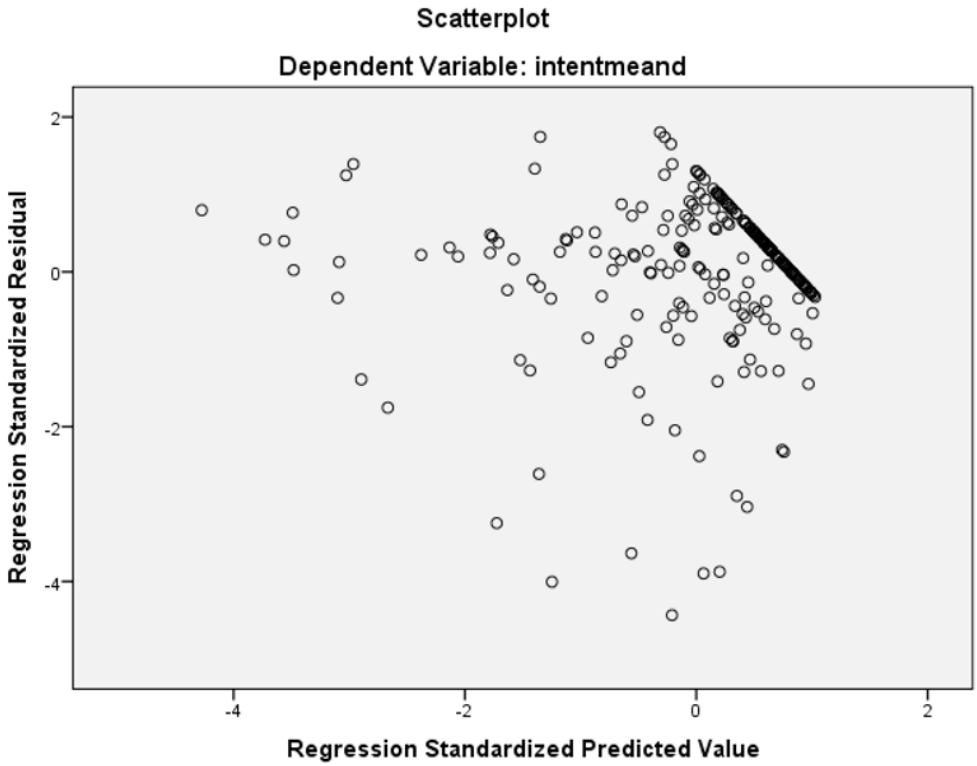
Assumptions testing of 'Expansive Model' (Homoscedasticity, normality and linearity)

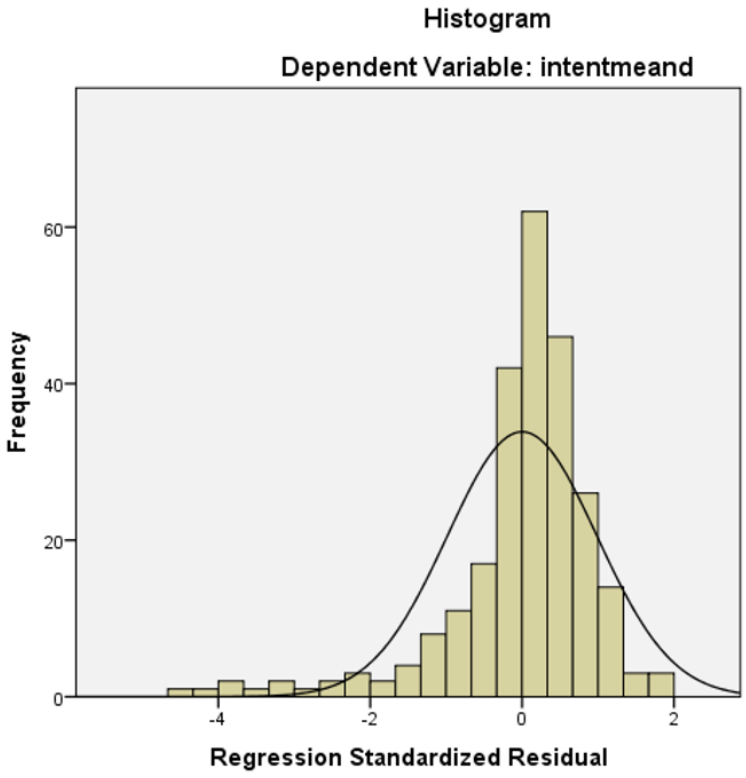


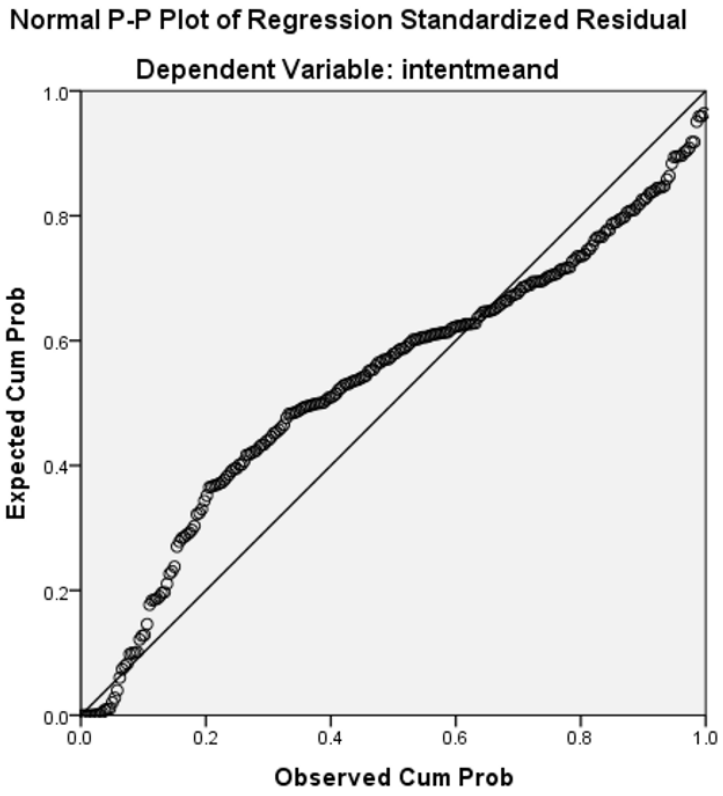



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: intentmeand
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

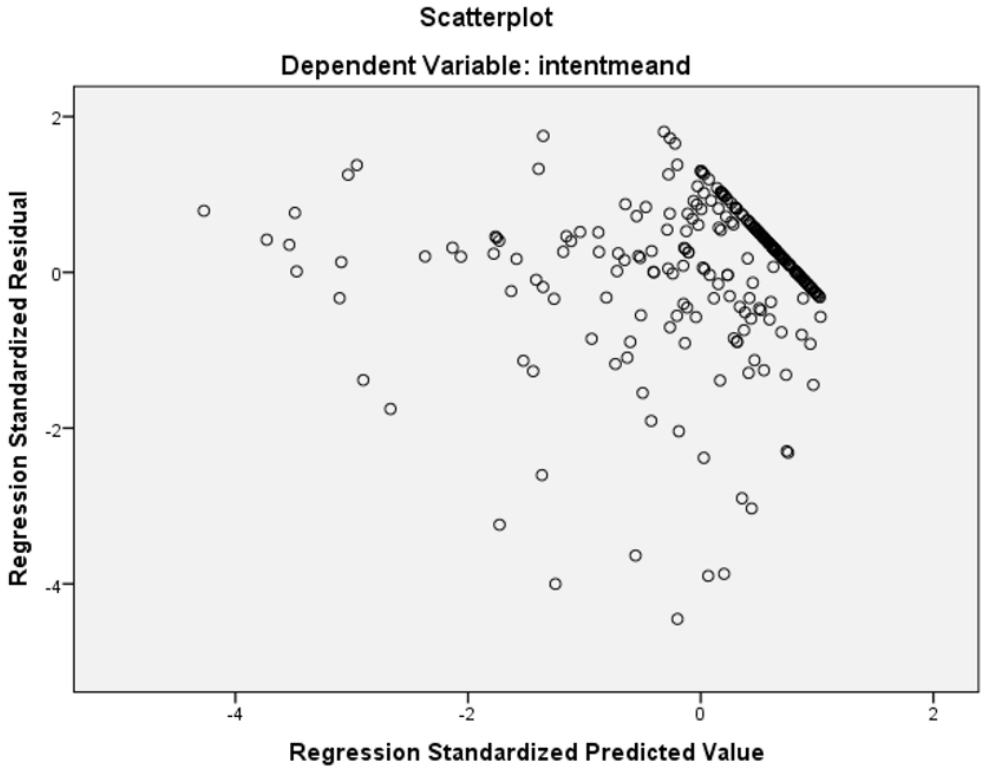
Assumptions testing of 'Metro Model' (Homoscedasticity, normality and linearity)

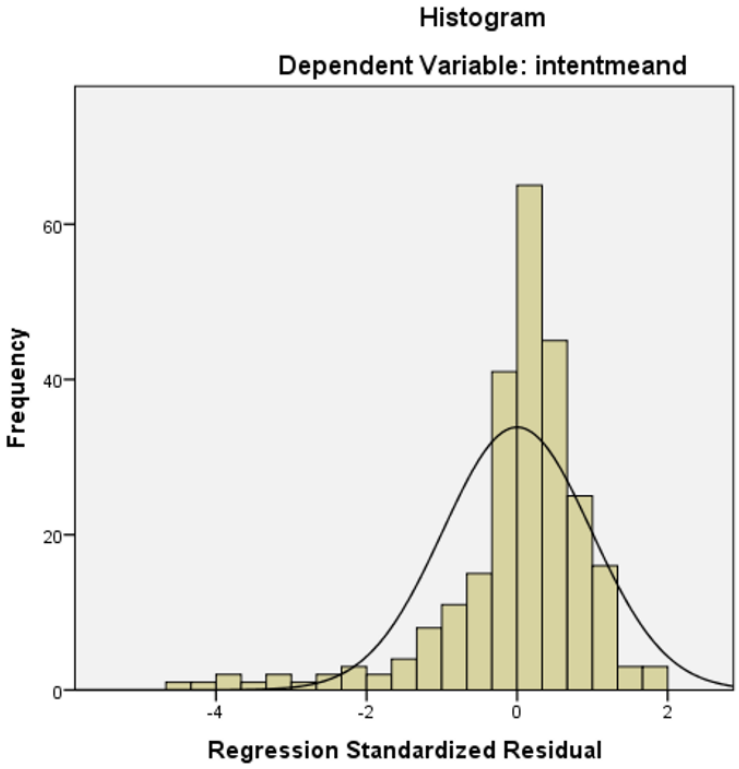


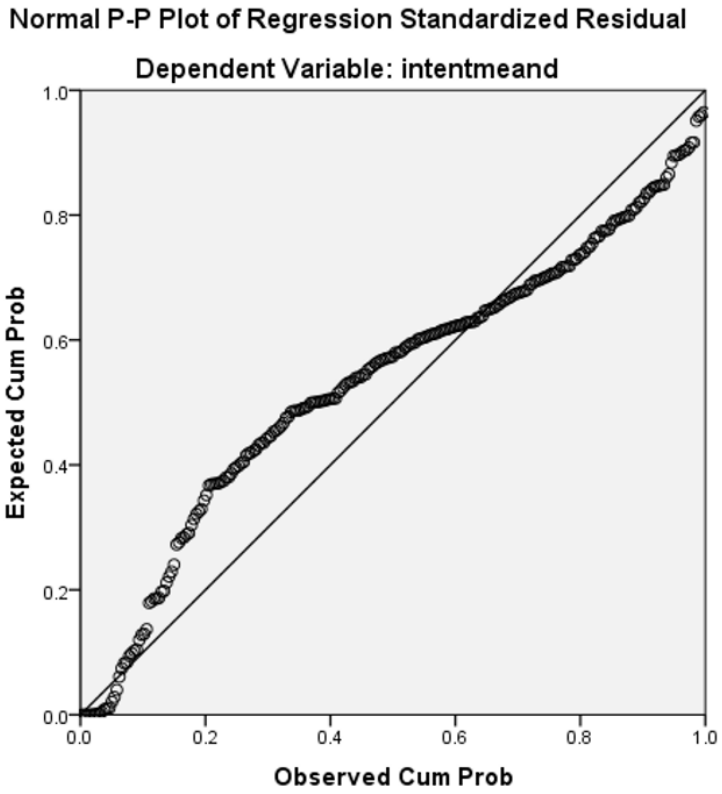



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: intentmeand
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

Assumptions testing of 'RA Model' (Homoscedasticity, normality and linearity)

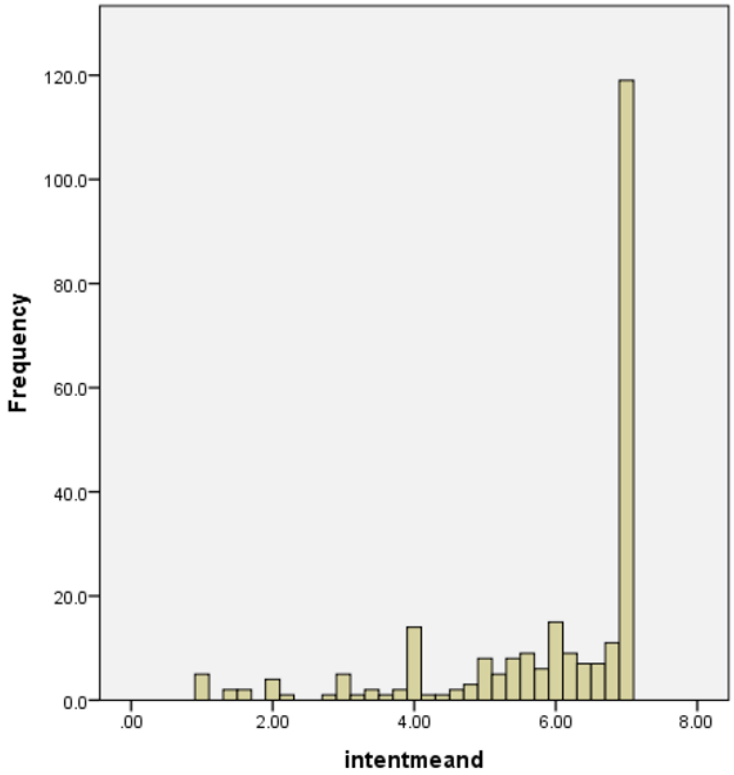




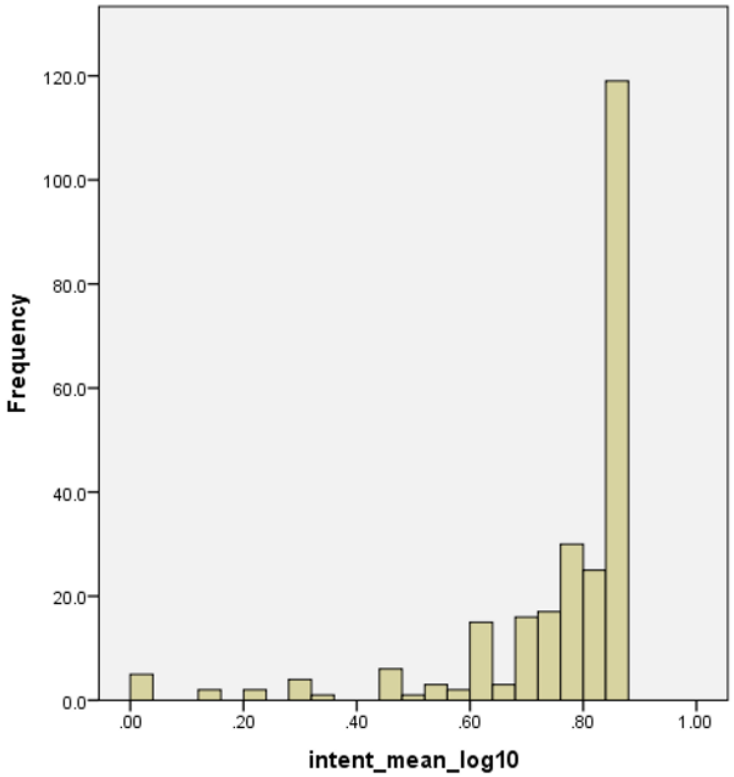

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: intentmeand
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

Appendix D

Skewed intention variable



Intention variable following log 10 transformations



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