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### EXPLORING THE SEPARATE AND COMBINED INFLUENCES OF TRANSPORT DISADVANTAGE AND SOCIAL EXCLUSION ON WELL-BEING

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#### ABSTRACT

This paper explores the separate and combined effects of transport disadvantage and social exclusion on well-being using an empirical analysis of data from a travel and disadvantage survey in Victoria, Australia. Previous research hypothesizes that a lack of transport causes or contributes to social exclusion and adopts qualitative and comparative approaches to explore these hypotheses. However few studies have measured the scale or strength of these links. Hence although well-being is known to be related to both transport disadvantage and to social exclusion their separate and combined influences have not been isolated.

An empirical model of transport disadvantage (TD), social exclusion (SE) and well-being (WB) is presented. The research hypothesizes that TD and SE are relatively independent constructs, but that people who experience both are significantly worse off than people who experience only one of these conditions. To test this hypothesis measures of subjective well-being are assessed for four groups: i. neither TD nor SE ii. with TD only iii. with SE only iv. with both TD and SE.

A disaggregate analysis adopting this framework then follows exploring how different forms of transport disadvantage and component measures of social exclusion relate to well-being. The disaggregation of transport disadvantage is based on previous research where a factor analysis isolates four statistically unique groups including 'Transit Disadvantage' (problems in accessing public transport), 'Transport Disadvantage' (general problems in access to transport), 'Vulnerable/Impaired' (older groups with health and mobility impairments) and 'Rely on Others' (those relying on other people for travel). The component constructs of social exclusion include income, unemployment, political engagement, participation and social support.

The paper finds that in general well-being is higher for those without TS or SE and that measures of well-being decline incrementally for those with (in order) only TD, only SE and those with both TD and SE. The size and relative scale of these relationships are described including differences in the findings associated with the disaggregate analysis. The paper concludes with a commentary on how the findings might be used to better target policy interventions and suggestions for future research in this field.

## 1 INTRODUCTION

The impact of transport disadvantage on other areas of life is an expanding research topic. A lack of transport can make it more difficult to access jobs, medical appointments, and social activities; it can contribute to social exclusion and even to lower well-being. A limitation of research in this field is the methodological approach to identifying the association between transport disadvantage and its impacts. Furthermore the measured impacts of transport disadvantage are often limited to accessibility and activity-based impacts, such as difficulty accessing work, health care, education or social activities. It is expected that the ultimate impact of the restricted access is a lower quality of life. Yet life satisfaction and quality of life measures are rarely studied in the context of transport disadvantage; the existing research is limited to elderly populations (Banister and Bowling 2004; Mollenkopf et al. 2005; Spinney et al. 2009).

This paper contributes a broader understanding of the impact of transport disadvantage and socio-economic disadvantage on the lives of a heterogeneous population sample from Melbourne and regional Victoria, Australia<sup>1</sup>. Rather than explore a direct causal impact of transport disadvantage on social exclusion, it looks at the separate and combined influences of these two forms of disadvantage on quality of life. Hence quality of life is measured on a sample displaying transport disadvantage but not social exclusion, a sample with social exclusion but without transport disadvantage and a sample with both.

The paper starts with a short review of the literature examining the relationship between transport, social exclusion and well-being. This is followed by a description of the research methodology. The results of the research are then presented. The paper concludes with a summary of the key findings including a discussion of the implications of the findings for future research in this field.

## 2 LITERATURE REVIEW

The negative impacts of transport disadvantage are receiving a great deal of focus in the research literature. Some of the literature uses macro-level measures such as spatial analyses which define transport disadvantage as distance from or travel time to jobs, shops, hospitals or education either by car or public transport (Church et al. 2000; Hine 2004; Department for Transport 2006). Indicator variables such as car ownership, licensing rates or public transport service levels are also used (Currie 2004; Hine 2004; Hurni 2007; Currie 2009). These are considered either spatially (e.g., comparing inner versus outer suburbs) or demographically (e.g., comparing high and low income groups).

These high-level comparisons have the advantage of comparing the conditions of advantaged and disadvantaged areas or groups. They sometimes demonstrate that people or areas who experience socio-economic disadvantage are more likely to also face transport disadvantage (e.g. Hurni 2007). But whilst these methods can demonstrate that the two conditions co-occur, they are limited in their ability to explore the nature of this relationship and the downstream impacts of transport disadvantage.

Focus groups and self-report surveys are often used to fill this methodological gap. Groups who are known to be socially excluded are surveyed or interviewed to help understand in the impact transport disadvantage has on their lives (e.g. Fritze 2007; Hurni 2007; Penfold et al. 2008). These studies provide a valuable depth of insight into the lives of these groups but research of this depth is rarely conducted across a heterogeneous survey sample. This is understandable considering the expense of conducting in-depth surveys, but by focussing on groups at only the extreme end of the spectrum of social and transport disadvantage the breadth of these issues across the population is unknown. It is

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also difficult to determine the degree to which transport disadvantage causes or contributes to social exclusion when only the socially excluded are interviewed.

A noteworthy exception is a report from the UK which used a representative sample of British households (Department for Transport 2002). If transport disadvantage contributes significantly to social exclusion, then it should follow that the excluded are more likely to face transport disadvantage. Yet the report found that people facing low levels of socio-economic deprivation were just as likely as those facing multiple deprivation to report difficulties accessing a range of activities because of transport problems. A more recent report using a heterogeneous survey sample in Melbourne, Australia similarly found that many facets of transport disadvantage were reported just as often among the socially included as amongst the excluded (Delbosc and Currie in press). Reports such as these highlight the importance of understanding the relationship between transport and social exclusion in a broader context.

Furthermore the *impacts* of transport disadvantage are often focused on accessibility and activity-based impacts, such as difficulty accessing work, health care, education or social activities. The UK Social Exclusion Unit has provided one of the most comprehensive overviews of the various impacts transport disadvantage has on people's lives but these impacts are centred on access to work, learning, healthcare, food shops, social and cultural activities and road accidents (2003). The report only mentions in passing that traffic noise or difficulty accessing social activities can influence people's overall quality of life.

Life satisfaction and well-being are increasingly being considered as outcomes of good public policy. Yet life satisfaction and quality of life measures are rarely studied in the context of transport disadvantage; the existing research is generally limited to elderly populations (Banister and Bowling 2004; Mollenkopf et al. 2005; Spinney et al. 2009). Emerging research using a broader sample population found that the relationship between the two is indirect and may be mediated by time poverty (Currie and Delbosc in press).

Building on the literature, this paper conceptualises transport disadvantage and social exclusion as relatively independent constructs. Not everyone who is socially excluded will face transport disadvantage and not everyone who faces transport disadvantage will be socially excluded. But people who face *both* transport disadvantage and social exclusion would be expected to have a lower quality of life than people facing only one of these challenges. This paper will test this hypothesis as well as exploring the relative influences of the two forms of disadvantage.

### **3 METHODOLOGY**

This paper aims to explore the separate and combined impacts of transport disadvantage and social exclusion on well-being. It uses a primary survey to quantify each construct and one-way ANOVAs with planned contrasts to demonstrate the empirical relationships between them. Planned contrasts are used in ANOVAs to predict the relative differences between groups.

#### **3.1 Measuring transport disadvantage, social exclusion and well-being**

An interview questionnaire was adopted to collect data on transport disadvantage, social exclusion and well-being using the approach identified below.

The survey data was collected in two stages. In the first stage, households that had completed a household travel survey called VISTA (the Victorian Integrated Survey of Travel and Activity, The Urban Transport Institute 2008) were invited to participate in a follow-on survey. The sample frame covered both socially advantaged and disadvantaged households (based on income) as well as groups who had good and bad access to transport and walk accessibility. Some 535 responses were from the greater Melbourne area (406 in outer suburban areas) and a further 148 were from regional and rural areas in the Latrobe Valley in Eastern Victoria.

In the second stage, a further 336 interviews were conducted on people facing acute social and economic disadvantage. This sample was recruited from government and non-government social support providers. A survey of their travel from the day before was included in their surveys. This sample contained a high proportion of low income persons, single parents, the disabled and carers of the disabled.

Overall the study had a sample of 1,019.

**Transport disadvantage** has been measured in hundreds of different ways (Dodson et al. 2004). In this study transport disadvantage is measured using subjective, self-reported measurements. Survey participants were asked to judge potential difficulties with eighteen different types of transport disadvantage (identified through a review of the research literature). They were asked to rate how easy or difficult they found such issues as ‘getting to places quickly’ or ‘covering the costs of transport’. All responses were subjective i.e. they record participants’ perception of their situation.

A principal component factor analysis (reported fully in Delbosc and Currie in press) determined that these questions could be expressed in four statistically significant underlying factors using 16 of the original 18 questions. Some 57% of the variance in responses was explained by the four factors derived. The output factors and their component transport disadvantage types are reported in Table 1. For this analysis people were classified as disadvantaged if they scored above the midpoint of the scale (3 on a scale of 1 to 5).

**Table 1: Derived Factor Groups – Type of Transport Disadvantage**

Factor Group Name	Component Feature of Transport Disadvantage
Transit Disadvantage	<ul style="list-style-type: none"> <li>• Buses/trains/trams being available at night</li> <li>• Buses/trains/trams being available at weekends</li> <li>• Buses/trains/trams operating frequently</li> <li>• Being able to make bus/train/tram connections</li> </ul>
Transport Disadvantage	<ul style="list-style-type: none"> <li>• Being able to travel when you want to</li> <li>• Being able to get around reliably</li> <li>• Finding transport so you can travel</li> <li>• Getting to places quickly</li> <li>• Finding the time to travel when you need to</li> </ul>
Vulnerable/Impaired	<ul style="list-style-type: none"> <li>• Being able to physically get onto/off buses/trains/trams</li> <li>• Needing help to get around on your own</li> <li>• Being able to understand where to go</li> <li>• Feeling safe from theft/attack when travelling on your own</li> </ul>
Rely on Others	<ul style="list-style-type: none"> <li>• Having to rely on others for transport</li> <li>• Finding someone to provide assistance when transport is available</li> <li>• Covering the costs of your transport</li> </ul>

**Social exclusion** is a complex, multi-dimensional construct. It is broader than the notion of poverty and refers to limits in societal participation and social support as a result of a combination of factors which may include unemployment, low income, discrimination, crime and poor skills (Cabinet Office Social Exclusion Task Force 2009). Its measurement includes multiple dimensions such as economic, social and political dimensions (Bhalla and Lapeyre 1997). Burchardt (2000) refined these dimensions to include income level, unemployment, political engagement and participation; social support has been suggested as fifth dimension (Stanley and Vella-Brodrick 2009). Specifically, social exclusion was measured using five dimensions:

- Income: Participants were classified into four categories of non- equivalised gross household income
- Unemployment: This included both those who were looking for work and those who were unemployed due to disability or illness
- Political engagement: This was measured by recording recent participation in political or community groups.

- Participation: Participants were asked if they have been excluded from a range of activities such as hobbies, sport and visiting libraries
- Social support: This was measured by asking how easily people could get help from close family, extended family, friends or neighbours if they needed it.

For the analysis the following cut-off points were used to classify people as socially excluded:

- Income: Gross household income below \$500/pw
- Unemployment: If the person was unemployed
- Political engagement: No political activities
- Participation: No regular activities
- Social support: Score of 9 or less out of 12 where people rated how easily they could get help from close family, extended family, friends and neighbours and 1 = “not at all”, 2 = “sometimes” and 3 = “yes definitely”
- Overall social exclusion: Where someone was excluded on two or more of the above dimensions

The measurement of **well-being** at the individual level is a mature research topic in social psychology (Kahn and Juster 2002). The papers to date that relate transport to well-being in research on aged cohorts used empirical measures of ‘affect’, ‘satisfaction with life’ and ‘quality of life’ (Banister and Bowling 2004; Mollenkopf et al. 2005; Spinney et al. 2009). For this study the Personal Well-being Index (PWI) was adopted. Participants indicated how satisfied they were with nine different aspects of their life (International Wellbeing Group 2005) on a scale from 0 to 10.

## 4 RESULTS

### 4.1 One-way ANOVAs

Survey respondents were classified into four groups based on transport disadvantage and social exclusion measures as described in section 3.1. Table 2 shows the sample size for each of these groups.

**Table 2: Group sample sizes**

Comparison		Neither TD nor SE	TD-only	SE-only	Both TD & SE
1.	Overall social exclusion Overall Transport disadvantage	585	116	237	81
Disaggregate Transport Disadvantage Measures					
2.	Overall social exclusion Sub-scale transit disadvantage	445	249	190	124
3.	Overall social exclusion Sub-scale transport disadvantage	581	120	246	72
4.	Overall social exclusion Sub-scale physical vulnerability	644	57	270	48
5.	Overall social exclusion Sub-scale rely on others	539	162	195	123
Component Social Exclusion Measures					
6.	Sub-scale income Overall Transport disadvantage	576	117	246	80
7.	Sub-scale unemployment Overall Transport disadvantage	690	147	132	50
8.	Sub-scale political engagement Overall Transport disadvantage	597	149	225	48
9.	Sub-scale participation Overall Transport disadvantage	749	175	73	22
10.	Sub-scale social support Overall Transport disadvantage	617	120	205	77

Note: Not all comparisons sum to  $N = 1,019$  due to missing data.

In the initial analysis (comparison 1 in Table 2) a one-way ANOVA was run across the four categories. A linear trend planned contrast was used to determine whether well-being measured on the PWI scale decreased linearly from the “neither” category to the “both” category.

Table 3 shows the means and the standard deviations (in parentheses) of the well-being ratings of the different TD/SE categories. The ANOVA for comparison 1 showed that which category people belonged to had a significant effect on well-being,  $F(3, 1,015) = 76.3, p < .001, \omega^2 = .18$ . The linear trend was also significant,  $F(1, 1,015) = 182.3, p < .001, \omega^2 = .15$  indicating that as categories moved from “neither” to “both TD and SE” well-being significantly dropped. The effect size suggests that this is a large effect ( $\omega^2$  values of .01, .06 and .14 represent the cut-off for small, medium and large effects respectively (Kirk 1996)).

However Levene’s test for homogeneity of variances was violated ( $F(3, 1,015) = 28.6, p < .001$ ) indicating that the variance across the four groups was not equal. A more robust test of equality of means, the Welch’s F test, still showed that the groups significantly differed (Welch’s  $F(3, 231) = 52.8, p < .001$ ). Although the assumption of equal variance was violated, the highly significant Welch’s F results suggest that these findings are robust. Those facing neither disadvantage had the highest ratings of well-being; people facing only TD or SE had lower ratings of well-being; people facing TD and SE in combination had the lowest ratings of well-being. The effect size was large which is expected as on average, someone with both forms of disadvantage has a PWI score 30% lower than someone facing neither challenge.

**Table 3: Means and standard deviations of well-being (PWI)**

Comparison		Neither	TD-only	SE-only	Both
1.	Overall social exclusion Overall Transport disadvantage	7.6 (1.3)	7.0 (1.3)	6.4 (1.8)	5.3 (2.2)
Disaggregate Transport Disadvantage Measures					
2.	Overall social exclusion Sub-scale transit disadvantage	7.6 (1.3)	7.3 (1.3)	6.4 (1.8)	5.7 (2.1)
3.	Overall social exclusion Sub-scale transport disadvantage	7.6 (1.2)	7.1 (1.4)	6.4 (1.8)	5.3 (2.1)
4.	Overall social exclusion Sub-scale physical vulnerability	7.5 (1.3)	7.1 (1.0)	6.3 (1.9)	5.2 (2.1)
5.	Overall social exclusion Sub-scale rely on others	7.6 (1.2)	7.1 (1.4)	6.7 (1.8)	5.3 (1.9)
Component Social Exclusion Measures					
6.	Sub-scale income Overall Transport disadvantage	7.4 (1.4)	6.9 (1.5)	7.0 (1.7)	5.5 (2.2)
7.	Sub-scale employment Overall Transport disadvantage	7.5 (1.4)	6.9 (1.5)	6.1 (1.8)	4.7 (2.1)
8.	Sub-scale political engagement Overall Transport disadvantage	7.4 (1.4)	6.4 (1.8)	6.9 (1.6)	6.0 (2.1)
9.	Sub-scale participation Overall Transport disadvantage	7.3 (1.5)	6.4 (1.9)	6.9 (1.6)	6.1 (2.4)
10.	Sub-scale social support Overall Transport disadvantage	7.6 (1.3)	7.1 (1.3)	6.3 (1.8)	5.2 (2.1)

Note: Standard deviations in parentheses

**Table 4: Significance tests**

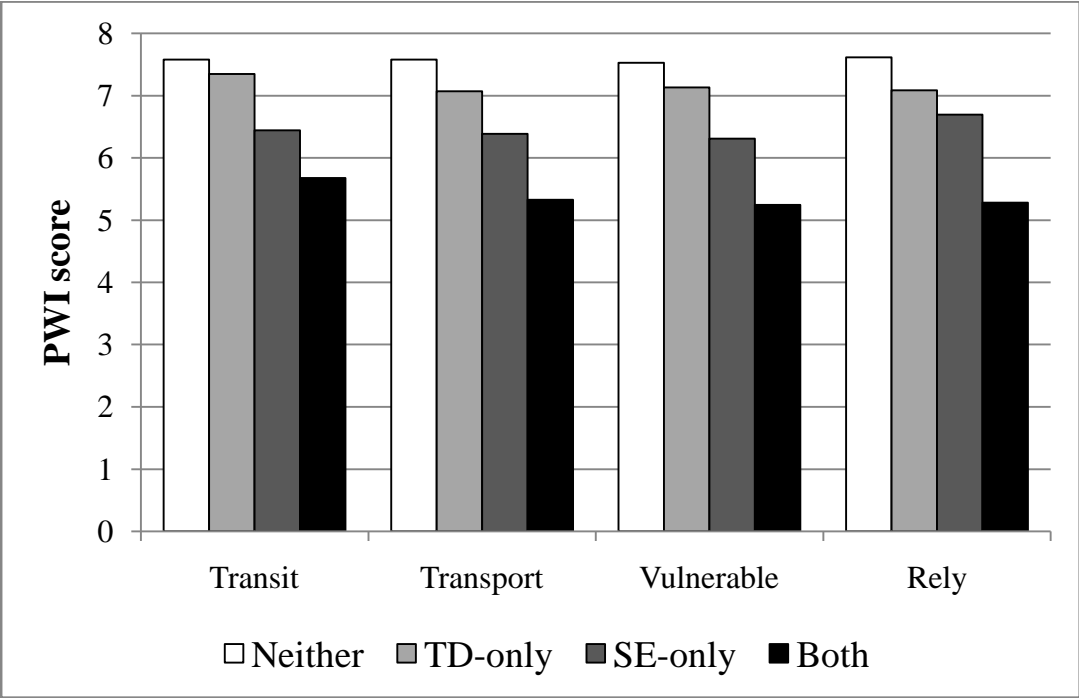
Comparison		Welch's F		Linear trend	
		Df	F	F <sup>†</sup>	$\omega^2$
1.	Overall social exclusion Overall Transport disadvantage	3, 231	52.8**	182.3**	0.15
Disaggregate Transport Disadvantage Measures					
2.	Overall social exclusion Sub-scale transit disadvantage	3, 359	47.2**	190.1**	0.16
3.	Overall social exclusion Sub-scale transport disadvantage	3, 219	52.5**	163.3**	0.13
4.	Overall social exclusion Sub-scale physical vulnerability	3, 133	47.1**	116.9**	0.10
5.	Overall social exclusion Sub-scale rely on others	3, 314	67.8**	254.4**	0.20
Component Social Exclusion Measures					
6.	Sub-scale income Overall Transport disadvantage	3, 234	21.3**	82.4**	0.07
7.	Sub-scale employment Overall Transport disadvantage	3, 161	50.3**	184.6**	0.15
8.	Sub-scale political engagement Overall Transport disadvantage	3, 174	19.5**	25.7**	0.02
9.	Sub-scale participation Overall Transport disadvantage	3, 39.9	8.50**	8.5*	0.01
10.	Sub-scale social support Overall Transport disadvantage	3, 220	54.0**	193.7**	0.15

Statistical significance is indicated by: \*  $p < .05$ , \*\*  $p < .001$

<sup>†</sup>Df for each linear trend is 1, 1,015

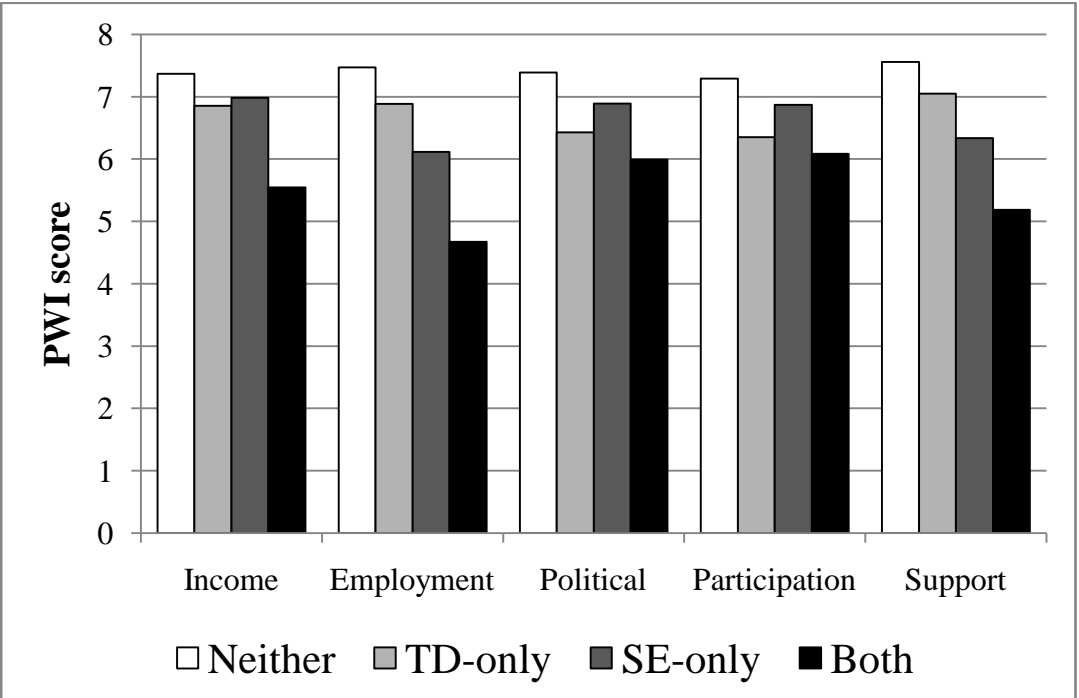
Further ANOVAs were conducted to explore the contributions of SE and TD in-depth. The first set of analyses (comparisons 2 to 5) looked at the influence of the four sub-scales of transport disadvantage. Participants were again grouped into four categories based on their level of SE and their TD sub-scale rating. As shown in Table 3 and Figure 1, the four different types of transport disadvantage had similar effects on well-being when combined with social exclusion. Groups facing only TD or SE had similar levels of well-being whereas facing both TD and SE showed much lower well-being ratings. The linear trends and Welch's F tests were all statistically significant, as shown in Table 4. The primary difference between the four analyses was in the effect size ( $\omega^2$ ). Transport disadvantage and physical vulnerability showed medium effect sizes ( $\omega^2 = .13$  and  $.10$ ) whereas transit disadvantage and rely on others had large effect sizes ( $\omega^2 = .16$  and  $.20$ ).

**Figure 1: Disaggregated Transport Disadvantage Measures and influences on well-being**



A comparison was also conducted by analysing the component measures of social exclusion. Different components had very different effects when combined with an overall measure of transport disadvantage; these are represented visually in figure 2. Income showed a linear trend with medium effect size ( $\omega^2 = .07$ ) and employment had the lowest overall well-being measure when combined with transport disadvantage. Political engagement and participation showed a less significant pattern with negligible effect sizes ( $\omega^2 = .02$  and  $.01$ ). Employment and social support showed the strongest linear trends with large effect sizes ( $\omega^2 = .15$ ).

**Figure 2: Component Social Exclusion Measures and Influences on Well-being**





## 4.2 Relative influence of TD and SE

Section 4.1 established that most comparisons followed a generally linear trend whereby well-being decreased as groups moved from neither TD nor SE to both TD and SE. A visual inspection of the results shows that social exclusion alone appears to have a greater influence on well-being than transport disadvantage. However in some cases the two well-being scores are very similar and in three cases (income, political exclusion and participation exclusion) the pattern is reversed.

To further explore the independent contributions of TD and SE, post-hoc tests were performed with an interest in whether the TD-only and SE-only groups significantly differed in any of the ANOVAs. The Games-Howell post-hoc test was chosen because the group variances were shown to be unequal. Table 5 shows the results of the Game-Howell tests.

**Table 5: Post-hoc evaluating difference between TD-only and SE-only groups**

TD-only and SE-only groups compared		Games-Howell test	
		Mean difference	Std. error
1.	Overall social exclusion Overall Transport disadvantage	.605*	.168
Disaggregate Transport Disadvantage Measures			
2.	Overall social exclusion Sub-scale transit disadvantage	.905**	.154
3.	Overall social exclusion Sub-scale transport disadvantage	.684**	.171
4.	Overall social exclusion Sub-scale physical vulnerability	.822**	.179
5.	Overall social exclusion Sub-scale rely on others	.391	.169
Component Social Exclusion Measures			
6.	Sub-scale income Overall Transport disadvantage	-.128	.178
7.	Sub-scale employment Overall Transport disadvantage	.766**	.196
8.	Sub-scale political engagement Overall Transport disadvantage	-.464	.187
9.	Sub-scale participation Overall Transport disadvantage	-.517	.232
10.	Sub-scale social support Overall Transport disadvantage	.713**	.177

Statistical significance is indicated by: \*  $p < .05$ , \*\*  $p < .001$

Games-Howell tests show that in six out of ten comparisons, the SE-only groups had significantly lower levels of well-being than the TD-only groups. In three comparisons (income, political exclusion and participation exclusion) the means were in the opposite direction; however these differences were not statistically significant. This analysis suggests that social exclusion alone may have a greater influence on well-being than transport disadvantage alone, especially social exclusion based on unemployment and a lack of social support.

## 5 SUMMARY AND CONCLUSIONS

This paper explores the separate and combined effects of transport disadvantage and social exclusion on well-being using a quantitative approach based on field survey evidence. Previous research has hypothesized that a lack of transport causes or contributes to social exclusion but has adopted generally qualitative and comparative approaches to explore these hypothesis which have made exploring the relative effects of transport and social exclusion issues impractical.

An empirical model of transport disadvantage (TD), social exclusion (SE) and well-being (WB) is developed using field survey evidence. The research explores the hypothesis that TD and SE are relatively independent constructs, but that people who experience both are likely to be significantly worse off than people who experience only one of these conditions. Aggregate results show that well-being for those with neither TD nor SE was 7.6 (out of ten) whilst it was progressively lower for those with only TD (7.0) those with only SE (6.4) and for those with both TD and SE (5.3). An effect size ( $\omega^2$ ) of .15 indicates that this combination has a large effect on well-being.

A disaggregate analysis of measures of transport disadvantage and component measures of social exclusion was also undertaken. Disaggregated transport disadvantage measures included 'Transit Disadvantage' (those with problems in accessing public transport), 'Transport Disadvantage' (general problems in access to transport), 'Vulnerable/Impaired' (older groups with health and mobility impairments) and 'Rely on Others' (those relying on other people for travel). Disaggregation of social exclusion was based on component constructs of SE including income, unemployment, political engagement, participation and social support.

Disaggregate results show that well-being varies for the sub-components of transport disadvantage and social exclusion. The socially excluded whose transport disadvantage forces them to rely heavily on others have the largest effect size ( $\omega^2 = .20$ ) and their well-being score is 32% lower than someone who faces no challenges. The socially excluded who face transit disadvantage (problems with public transport in general) also have a large effect size ( $\omega^2 = .16$ ) and have 26% lower well-being score. People who face transport disadvantage and are unemployed or lack social support have a large effect size ( $\omega^2 = .15$ ) and some of the biggest gaps in their relative well-being (37% and 32% lower, respectively).

Overall the results confirm the hypothesis that well-being reduces linearly from those with neither TD nor SE, to those with TD only, then SE only, then those with both TD and SE. This linear relationship was statistically significant for all of the comparisons with medium to large effect sizes. Further analyses explored whether TD only or SE only had a greater influence on WB. The Games-Howell post-hoc test suggested that social exclusion alone may have a greater influence on well-being than transport disadvantage alone, especially social exclusion based on unemployment and a lack of social support.

Two disaggregate analyses stand out as being significantly different to the other analyses. The component analyses of participation and political engagement were statistically significant but their effect sizes were minimal ( $\omega^2 = .01$  and  $.02$ , respectively) meaning that any linear effect is very small. Furthermore on both of these measures people experiencing that component of social exclusion alone had *higher* well-being (average 6.9) than people experiencing transport disadvantage alone (average 6.4). According to the Games-Howell post-hoc test, for these two components there was no significant difference between the TD-only group and the TD & SE groups, suggesting that these components of social exclusion are not contributing to lower well-being. This raises questions about the validity of these two measures as components of social exclusion.

These findings can be used to better target policy interventions to address those exhibiting lower well-being. Improving public transport and helping people who rely on others for transport may be more effective than targeting general transport disadvantage. Building social support networks for the socially excluded and helping people find employment are other more obvious interventions. Conversely, encouraging political engagement and participation in activities in isolation may not be an effective intervention unless these activities lead to employment or build support networks.

These findings act to support the need to address both social exclusion and transport disadvantage in order to improve well-being and quality of life. Wider application of the quantitative approaches presented to wider disaggregate social groups and contexts should further inform approaches to addressing disadvantage into the future.

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