Research article

Encouraging young adults with a disability to be independent in their journey to work: A segmentation and application of Theory of Planned Behaviour approach

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A B S T R A C T

This study investigates how young adults with disabilities can be encouraged to be independent in their travel to work and thus, transition more smoothly into the workforce. Using cluster analysis, we identify three segment groups of young adults with physical disabilities. The Theory of Planned Behaviour is then applied to examine differences and identify strategies that could provide assistance and support to these groups of workers in their travel to work. This study is the first to segment this group of workers and identify strategies to mitigate the often-unique challenges they face in their physical journey to work.

1. Introduction

Young adults with a physical condition represent 62% of young people with a disability (AIHW, 2011). Historically, these individuals' lifespans were significantly shorter than they are today, however, due to significant developments in medical interventions, young adults with a physical disability are now living late into their 20's and 30's (Binks et al., 2007). Interestingly, although these individuals are living longer, academic research is limited in its depth of understanding of how this population can be supported in their later years of life (Brzykcy et al., 2019). One area specifically where further research is needed is how young adults with a disability can be assisted and supported to gain and maintain employment (Huang et al., 2013; Lindsay et al., 2017; Santilli et al., 2014). This further research is needed as young adults with physical conditions are more likely to experience discrimination in the workplace (Balser, 2002), are over represented in non-standard working

arrangements such as part-time and temporary employment (Shuey and Jovic, 2013), and experience higher rates of unemployment then their peers without disabilities (Hoque et al., 2014; Huang et al., 2013; Malviya et al., 2012; Michelsen et al., 2005). In particular, the potential negative outcome of long term unemployment in terms of social isolation, negative self-esteem, well-being and inequalities is well understood which signifies the importance of research into disabilities and employment from the individual or employee's perspective (Bolíbar et al., 2019; Foster, 2007).

Research has begun initial investigations into disabilities and employment by identifying training programs (Shandra and Hogan, 2008; Taylor et al., 2004), school support (Carter et al., 2012), job interview training (Wright and Multon, 1995), demographic and social factors (Rabren et al., 2002) which influence these individual's transition into the workforce. Whilst, providing preliminary insights, further research is still required to better understand the factors which influence

the gaining and maintaining of employment for these individuals (Vogtle, 2013). The current study assists by examining the physical journey to work for these young adults and in particular, how their independence in their travel to work can be encouraged and supported. Being able to travel independently to work is paramount for young adults with disabilities being able to gain and importantly, maintain employment.

Previous academic investigations of young adults with disabilities suggests that there are two key factors which influence whether an individual will be independent and these in turn, effect their transition to the workforce. These are sociocultural factors and psychosocial factors (Abbott and Carpenter, 2014; Lindsay et al., 2017). The current study utilises these factors to segment the young adult with physical disabilities' population. It is important that segmentation is undertaken as the first step in this study, before strategies are developed to support these individuals in their independent travel, as previous research suggests the young adults with disabilities' population is heterogenous due to the differences in actual disabilities and factors which influence decisions and motivations (Abbott and Carpenter, 2014; Huang et al., 2013; Lindsay et al., 2017). Therefore, it is imperative smaller segments are identified so that strategies can be developed which are relevant to each homogenous group of individuals to encourage and support their independent physical journey to work.

Once these groups are identified, strategies can be developed to assist these individuals in increasing their independence in their travel to work and in turn, smooth their transition into the workforce. One theory which is utilised extensively in the literature to underpin the development of behaviour change strategies is the Theory of Planned Behaviour (Ajzen, 2002; Ajzen and Driver, 1992; Conner and Armitage, 1998; Daellenbach et al., 2018). This theory suggests three factors (attitudes, subjective norms and perceived behavioural control) influence one's intention to perform a behaviour and in turn, the actual performance of the behaviour (Ajzen, 1991). This theory provides a solid underpinning for the current study to identify differences between the segments and in turn, the development of strategies to encourage and support young adults with a disability to be independent in their travel to work.

The objective of the current study is therefore to 1) identify meaningful and accessible segments of the young adults with a physical disability population, utilising psychosocial and sociocultural factors and 2) to develop further understanding of how these segments can be targeted to increase their independence in their travel to work through the application of the Theory of Planned Behaviour. In doing so this study makes three key contributions: 1) it is the first to segment the young adults with a physical disability population, 2) it applies the Theory of Planned Behaviour to identify differences across these groups and 3) it develops strategies to increase the independence of these individuals in their travel to work.

2. Theoretical background

2.1. Young adults with a disability

Young adults classified under the broad category of *physical disability*, represents a very diverse group of conditions that have different motor and movement functional effects, different body part involvement and varying levels of severity. Conditions include: Cerebral Palsy, a group of disorders affecting movement, tone, coordination and posture; degenerative neuromuscular conditions such as Muscular Dystrophy (muscle weakness); rheumatic disease such as Juvenile Idiopathic Arthritis (joint stiffness and deterioration); Spina Bifida (defect of the neural tube of spinal cord) some with hydrocephalus abnormal enlargement of the brain cavities (ventricles) caused by a build-up of cerebrospinal fluid (CSF); or young adults with limb differences (Achieve Australia, 2018).

Young adults with severe life limiting conditions such as those mentioned above, once faced death in their late teens (mean 19 years) however, are now living into their late 20s–30s (mean age 26 years) due to advancements in medical interventions (Binks et al., 2007). Although

these lifespan changes are being realised in society with individuals living longer, there has been limited academic investigation into how this segment of society can be supported in later years of life. One area which is of particular importance however, limited in previous empirical examination, is the transition to the workforce post-secondary school for these individuals (Abbott et al., 2012; Gibson et al., 2007).

Previous research into the transition to the workforce for young adults with a disability has focussed primarily on training programs which may assist the transition (Shandra and Hogan, 2008; Taylor et al., 2004) and factors influencing employment such as school support (Carter et al., 2012) and demographic and social factors (Rabren et al., 2002). Although this previous research provides some interesting preliminary insights into the transition into the workforce for young adults with a disability, greater understanding is still required to broaden our knowledge of this topic (Foster, 2018). One area where greater insight is specifically needed is into how young adults with a disability can be encouraged to be more independent in their physical travel to work. This is of importance because if young adults with a disability do not feel independent in their journey to work, this presents a significant challenge for these individuals to gain and continue employment, ultimately impacting on their transition and continuity in the workforce.

2.2. Market segmentation

Before identifying how young adults with a disability can be encouraged to be more independent in their physical travel to the workplace, it is important to first identify if there are any differences among these individuals so that appropriate and specific interventions can be developed. This has not yet been established in prior literature with limited segmentation analysis of young adults with a physical disability being undertaken. Segmentation allows for the breakdown of a large heterogeneous group such as young adults with physical disabilities into smaller more homogenous segments (Daellenbach et al., 2018; Smith, 1956). As such, in the current context, segmentation will allow for segments, or small groups of young adults with a disability, to be identified who have similar characteristics. Segmentation therefore is the first step in the development and implementation of different programs for differing young adult groups in the overall market (Blattberg and Sen, 1974). This is relevant for the current study as literature suggests young adults with physical disabilities are a diverse segment of society with differences in their actual disabilities and factors which influence their decisions and motivations (Abbott and Carpenter, 2014; Huang et al., 2013; Lindsay et al., 2017). Therefore, this large heterogeneous group needs to be segmented into clusters so that appropriate strategies can be developed to assist each segment to increase their independence in travelling to work, and thus create best practice and mitigate fragmentation of support and strategies.

2.3. Segmentation variables

Why young adults with a physical disability, experience barriers to gaining and maintaining success in employment is still being understood. However, from a review of the literature it is evident that there are two key variables that are likely to influence a young adult with a physical disability's capacity to travel independently to work and in turn, transition into the workplace successfully. These factors include sociocultural factors and psychosocial factors (Abbott and Carpenter, 2014; Lindsay et al., 2017). It is important to note that this study does not attempt to include all possible factors that may influence an individual's independence in their physical journey to work but does however, seek to utilise the key influences acknowledged in previous literature to identify characteristics on which clusters should be developed. Therefore, in the current context, groups were segmented on their responses to feelings of sociocultural and psychosocial factors, specifically social support and desire respectively.

2.3.1. Sociocultural factors

Literature identifies that sociocultural factors significantly influence a young adult's independence and in turn, their independent transition into the workforce. This is due to sociocultural factors, such as discrimination and negative attitudes, continuing to be encountered by young adults in their post school pursuits (Abbott and Carpenter, 2014; Baker et al., 2009; Lindsay et al., 2017). For example, Lindsay et al. (2017) report that young adults with Spina Bifida experience discriminatory and negative attitudes at school and work because of a lack of knowledge and understanding about people with disabilities. These negative attitudes often influence young adults with a physical disability's goals and decisions around employment (Lindsay et al., 2017; Shaw et al., 2006). For instance, Shaw et al. (2006) identified that many young adults abandoned their previous aspirations to gain employment due to negative attitudes. This shows that a lack of support can have serious implications for young adults with a disability's independent transition into the workforce. Conversely, support from close friends and relatives has been shown to be a significant positive indicator of whether a young adult with a disability gains employment after school (Carter et al., 2012; Davies and Beamish, 2009). For instance, Carter et al. (2012) identified that when parental expectations were high that a young adult with a disability would gain employment after school, the young adults were five times more likely to gain employment. While Davies and Beamish (2009) identified that parental involvement and support in setting goals for post school life, were instrumental in assisting young adults with disabilities to gain employment post-secondary education. These studies highlight the importance of sociocultural factors in assisting individuals' transition into the workforce and specifically, the impact of social support in encouraging independent transitioning. As such, it is evident that sociocultural factors should be utilised in the segmentation process.

2.3.2. Psychosocial factors

Initial research has identified that psychosocial factors such as self-concept (Lindsay et al., 2017), self-determination (Abbott and Carpenter, 2014; Rutkowski and Riehle, 2009), intrinsic motivation (Zukerman et al., 2010) and independence (Jetha et al., 2015) also play a significant role in independent school-to-work transition success. For instance, Shaw et al. (2006) reported that self-belief had a strong impact on a young adult with a disability's work outlook. If an individual experienced anxieties about their ability to transition to the workforce and cope with the demands, they were less likely to have a positive work outlook and want to join the workforce (Shaw et al., 2006). Zukerman et al., 2010 identified that intrinsic motivation had a significant influence on gaining and maintaining employment for young adults with a physical disability. This was due to the authors considering this factor important in both gaining and maintaining employment. This previous research identifies the importance of psychosocial factors in the transition into the workforce and as such, it is concluded that this is another important factor on which groups should be segmented in conjunction with socio-cultural factors.

2.4. Understanding the differences between groups using the Theory of Planned Behaviour

After segmenting young adults with physical disabilities into groups utilising sociocultural and psychosocial factors identified in the literature, understanding can be gained into the differences across these groups and in turn, targeted strategies developed to encourage independent travel to work. One way to examine such differences and identify strategies that has been empirically validated and utilised widely in the literature is the application of the Theory of Planned Behaviour (Ajzen, 2002; Conner and Armitage, 1998; Parkinson et al., 2018; Roberts and Smith, 1999). This theory proposes the factors which influence an individual's intent to perform a behaviour, which in the current study would be travelling independently to work. The theory proposes that one's attitudes, subjective norms and perceived behavioural control all influence their intentions to perform a behaviour which in turn, influences their actual behavioural performance (Ajzen, 1991).

The attitude towards the behaviour involves one's overall evaluation of that behaviour and can be positive or negative (Ajzen, 1991). In relation to the current study, this would involve whether the young adult with a physical disability has a positive or negative attitude to travelling to work independently. The subjective norms involve whether the individual perceives it to be socially acceptable to perform the behaviour and whether their friends and family support the decision (Ajzen, 1991). Finally, perceived behavioural control relates to whether the individual feels they have the control to perform the behaviour (Ajzen, 1991). For instance, does the young adult have the perceived control to travel to work independently? The Theory of Planned Behaviour suggests the examination of these three variables identifies whether an individual will have the intention to travel to work independently and ultimately perform the behaviour.

Thus, the objective of this study is to 1) identify meaningful and accessible segments of the young adults with a physical disability population, utilising psychosocial and sociocultural factors and 2) develop further understanding of how these segments can be targeted to increase the independence in their travel to work through the application of the Theory of Planned Behaviour.

3. Method

3.1. Sample

An online survey was administered through an online panel between August and September 2017. The respondents were screened to ensure they were aged between 18-35 years of age (young adults), had a physical disability and were seeking employment or recently employed. A final sample of 200 participants were included. Over half of the participants were male (55%) and lived with their family (65.5%). The majority were employed in full time work (43.5%) and were passengers in a car (46%) as their main form of transport to work. An overview of the sample characteristics can be seen in Table 1.

3.2. Procedures

After participants were recruited through SSI (Survey Sampling International), they were provided with the ethics documents for the study. Ethical approval was obtained through the researcher's home university (University Human Research Ethics Committee – UHREC) and the research was conducted in line with standard ethical guidelines and the National Statement on Ethical Conduct in Human Research (Australian Government, 2007). Participants were informed that participating was entirely voluntary and at any stage they could withdraw from the survey without consequence. Consent was achieved by individuals clicking on a continue button after reading the ethics coversheet. It is important to note, as this was a vulnerable population, information was provided on the coversheet as to what the survey would involve, the risks and benefits, as well as contact details for relevant organisations should participants wish to speak with anybody about the study.

After providing consent, screening questions were completed followed by demographic questions, questions about individual's disabilities such as their diagnosis, social support and desire measures, and the Theory of Planned behaviour measures.

3.3. Instruments

Previously validated and reliable scale items were utilised in the current study. Demographic details were collected first including age, gender, state, education, living situation, disability and employment status. To achieve the first objective which was to identify meaningful and accessible segments of the young adults with a physical disability

Table 1. Sample characteristics.

	Number	Percentage of total
Gender		
Male	110	55%
Female	90	45%
Current Living Arrangements		
Living alone	37	18.5%
Living with family	131	65.5%
Living with others	32	16.0%
Employed		
Employed	168	84%
Unemployed	32	16%
Employment Status		
Employed working full-time	87	43.5%
Employed working part-time	43	21.5%
Employed working in a casual position	27	13.5%
Employed in a paid internship	4	2.0%
I am a volunteer, not looking for paid work	4	2.0%
I am a volunteer and looking for work	9	4.5%
Unemployed looking for full-time work	8	4.0%
Unemployed looking for part-time work	11	5.5%
Unemployed looking for casual work	7	3.5%
Main Form of Transport Used		
Train	71	35.6%
Bus	77	38.5%
Ferry	126	6.3%
Tram	21	10.3%
Car driver	92	46.0%
Car passenger	90	44.8%
Taxi/Uber	41	20.7%
Motorbike or motor scooter	8	4.0%
Power wheelchair or mobility scooter	9	4.6%
Bicycle	11	5.7%
Walk only	19.6	9.8%
Work at home	9	4.6%

population utilising psychosocial and sociocultural factors, a psychosocial and sociocultural factor were utilised to segment the market.

As identified in the literature review, sociocultural and psychocultural factors significantly influence a young adult's independence and in turn, their independent transition into the workforce. As such, one of each type of these factors was utilised to segment the market, and in turn, provide greater insight into this segment and how they may be supported. Again, it is important to acknowledge that this study does not attempt to include all possible factors that influence one's independence in their journey to work but instead, seeks to utilise the key influences acknowledged in previous literature to identify characteristics on which clusters should be developed. The two factors selected were social support as this was identified as an important sociocultural factor in previous literature by Carter et al. (2012), and desire, which had been identified as an important psychosocial characteristic by Beatson et al. (2019).

Social support was measured utilising a previously validated social support scale (Lysaght et al., 2012). This measure included asking participants to rate their agreeance with statements such as "My friends are available to talk to me about my personal problems" on a 7-point Likert scale. This measure is relatively new, and the current study is one of the first to implement this measure. As such, the reliability and validity of the scale in the context of this study were thoroughly examined in the results to ensure its appropriateness. Desire, was measured utilising a seven-point Likert scale (Perugini and Bagozzi, 2001). This scale is rigorously used in the literature and has been shown to be reliable and valid in a wide range of contexts including disability (Beatson et al.,

2019) as well as retailing (Hunter, 2006), responsible drinking (Fry et al., 2014) and the airline industry (Beatson et al., 2019; Hwang and Lyu, 2019).

Finally, to achieve the second objective of the study, which was to develop further understanding of how the segments can be targeted to increase independence in their travel to work, the Theory of Planned Behaviour was tested utilising scale items developed by Perugini and Conner (2000). This scale has also been widely utilised in the academic literature including the disability literature (Beatson et al., 2019).

3.4. Data analysis

To address the objectives and purpose of this research, two stages of analysis were carried out. The first stage of analysis involved addressing the first research objective of identifying meaningful and accessible segments of the young adults with a physical disability population utilising psychosocial and sociocultural factors. As such, two-step cluster analysis was employed. Two-step cluster analysis has been utilised widely in the literature (Okazaki, 2006; Punj and Stewart, 1983; Rundle-Thiele et al., 2015) and is useful in identifying different segments in heterogeneous groups (Daellenbach et al., 2018). It further allows for the empirical classification of objects and is appropriate due to its ability to cluster large data sets with both continuous and categorical attributes (Okazaki, 2006). Although some limitations of cluster analysis have been identified in previous literature (Dolnicar, 2003), due to the benefit of cluster analysis being able to empirically classify objects and its extensive use in past literature to achieve similar objectives as the current study, it was deemed suitable to use to identify the segments of the young adults with a physical disability population in this study. This approach has previously been employed in segmentation studies (Rundle-Thiele et al., 2015).

Stage two of the data analysis addressed the second objective of the research which was to develop further understanding of how these segments could be targeted to increase the independence in their travel to work. To achieve this, the factors which influenced the individual segments needed to be identified as well as the differences between these segments across the groups. As such, a process involving conducting ANOVA's to examine the differences between the clusters in terms of the various constructs of the Theory of Planned Behaviour was undertaken. SPSS 25 was utilised to conduct the cluster analysis and identify differences between individual segments established in stage one of the data analysis.

To ensure the validity and reliability of the scales utilised, a confirmatory factor analysis was undertaken before each stage of the data analysis utilising a Principal Component Analysis extraction method in SPSS 25. This was to ensure that the psychometric properties of the items remained consistent with those of previous studies and in turn, the measures included in the current study were deemed valid and reliable in the current disability context.

4. Results

4.1. Stage one- segmenting the young adult with a physical disability population

4.1.1. Confirmatory factor analysis

A confirmatory factor analysis (CFA) was first undertaken on the variables which were utilised to develop the clusters. The purpose of this CFA was to ensure the validity and reliability of the measures utilised in the current study (see Tables 2 and 3). The average variance extracted (AVE) scores were above the recommended threshold of 0.50 and all composite reliability scores were above 0.70 (Fornell and Larcker, 1981). Convergent validity was also confirmed by ensuring loadings were above 0.7, communalities above 0.5 and AVE scores above 0.5. While discriminant validity was assessed by comparing AVE scores to the shared variance between the constructs (Fornell and Larcker, 1981). As

Table 2. Construct measurement summary.

	Loading	AVE	CR
Friends Social Support		0.764	0.957
Showed they supported me	0.868		
Helped me with getting ready for work	0.680		
Care about what happens to me	0.916		
Are available to talk to me about my personal problems	0.930		
Are available to talk to me about my work-related problems	0.926		
Would help if I needed transportation	0.901		
Would help if I was having problems	0.868		
Desire		0.840	0.940
I desire to be independent in getting to work	0.915		
Being independent in getting to work is something I want to do	0.920		
I strongly desire to be independent in getting to work	0.915		

AVE = average variance explained; CR = composite reliability.

Table 3. Correlations and shared variances between constructs.

Construct	AVE Score	Desire	Social Support
Social Support	.764		.303
Desire	.840	.550**	

Note: **p < .01.

can be seen in Table 3, the AVE score exceeds the shared variances of constructs in each comparison, confirming discriminant validity.

4.1.2. Cluster analysis

Two-step cluster analysis was undertaken in SPSS using the log-likelihood measure to identify natural groupings in the data (Norusis, 2011). The silhouette measure of cohesion and separation was above the required level of 0.0 being 0.5, suggesting that the within cluster distance and the between cluster distance was valid (Rundle-Thiele et al., 2015). The two-step cluster analysis produced three clusters. The characteristics of each segment are discussed below and summarised in Table 4. The segments were named 1) *Highly Motivated and* Supported, 2) *Moderately Motivated and* Supported, and 3) *Lowly Motivated and* Supported.

Segment One- Highly Motivated and Supported consisted of slightly more females (54.74%) than males with individuals working mostly full-time (45.26%). The majority of individuals were aged between 30-35 years of age [30–32 (25.26%) and 33–35 (18.95%)]. Individuals in this segment were more likely to utilise a car as a driver (52.63%) or passenger (44.21%) or catch the bus (27.37%) as their mode of transport to get to work. *Highly Motivated and* Supported were characterised by high levels of sociocultural factors evidenced through high levels of support from friends in being independent in travel to and establishment at work. In terms of psychosocial factors, these *Highly Motivated and* Supported individuals had a high desire to be independent in their travel to work.

Segment Two- Moderately Motivated and Supported consisted of more males (62.07%) than females with individuals working mostly full-time (41.38%). This segment was characterised by individuals aged between 30-35 years of age [30–32 (22.41%) and 33–35 (29.31%)]. Individuals were likely to utilise a car as a passenger (36.21%) or catch the bus (36.21%) or train (32.76%) as their mode of transport to get to work. This segment experienced moderate support from their friends and moderate desire to be independent in their travel to work.

Consistent with Segment Two, *Segment Three- Lowly Motivated and* Supported consisted of more males (65.96%) than females and individuals working full-time (42.55%). This segments age distribution was skewed towards the 21–23 years of age range (23.4%) and the 30–32

years age range (19.15%). This segment was most likely to utilise the bus (44.68%) or be a passenger in a car (31.91%) when travelling to work. This segment experiences the lowest levels of both sociocultural and psychosocial factors including a low desire to travel independently and low social support.

4.2. Stage two- identifying differences and developing strategies

4.2.1. Confirmatory factor analysis

A confirmatory factor analysis (CFA) was then undertaken on the five variables of the Theory of Planned Behaviour to assess validity and reliability (see Tables 5 and 6). All constructs utilised in the model satisfied the requirements with the AVE scores being above the recommended threshold of 0.50 and composite reliability scores being above 0.70 (Fornell and Larcker, 1981). Convergent validity was assessed by ensuring loadings were above 0.7, communalities above 0.5 and AVE scores above 0.5. Discriminant validity was confirmed as the AVE score exceeds the shared variances of constructs in each comparison (Fornell and Larcker, 1981) as can be seen in Table 6.

4.2.2. ANOVA analysis examining differences among segments

4.2.2.1. Attitudes. A one-way ANOVA with post hoc tests (Tukey) was undertaken to examine if the cluster segments identified in stage one differed significantly based upon their attitudes to being independent in their journey to the workplace. It was identified that a significant difference was present across groups, $F(2, 199) = 114.898, p < .001$ with *Highly Motivated and* Supported producing the highest attitudes (M = 6.263), followed by *Moderately Motivated and* Supported (M = 5.3165) and then *Lowly Motivated and* Supported (M = 3.947). The post hoc tests identified a significant difference between *Highly Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$), *Moderately Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$) and *Highly Motivated and* Supported and *Moderately Motivated and* Supported ($p < .001$). These results suggested that *Highly Motivated and* Supported had significantly more positive attitudes to being independent in their journey to the workplace than *Moderately Motivated and* Supported, who had more positive attitudes than *Lowly Motivated and* Supported.

4.2.2.2. Subjective norms. A one-way ANOVA with post hoc tests (Tukey) was then undertaken to examine if there were differences between the clusters based upon their subjective norms. It was identified that a significant difference was present across groups, $F(2, 199) = 154.667, p < .001$ with *Highly Motivated and* Supported producing the highest subjective norms (M = 6.574), followed by *Moderately Motivated and* Supported (M = 5.276) and then *Lowly Motivated and* Supported (M = 3.624). The post hoc tests identified a significant difference between *Highly Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$), *Moderately Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$) and *Highly Motivated and* Supported and *Moderately Motivated and* Supported ($p < .001$). Similar to attitudes, these results suggested that *Highly Motivated and* Supported were influenced more by their subjective norms of being independent in their journey to work than *Moderately Motivated and* Supported, who were influenced more than *Lowly Motivated and* Supported.

4.2.2.3. Perceived behavioural control. A one-way ANOVA with post hoc tests (Tukey) was undertaken to examine if the cluster segments differed significantly based upon their perceived behavioural control. It was identified that a significant difference was present across groups, $F(2, 199) = 68.201, p < .001$ with *Highly Motivated and* Supported producing the highest perceived behavioural control (M = 5.909), followed by *Moderately Motivated and* Supported (M = 4.879) and then *Lowly Motivated and* Supported (M = 3.291). The post hoc tests identified a significant difference between *Highly Motivated and* Supported and *Lowly*

Table 4. Segment characteristics.

	Segment One N = 95		Segment Two N = 58		Segment Three N = 47	
	Mean	SD	Mean	SD	Mean	SD
Construct						
Desire	6.695	.453	5.552	.880	3.410	.907
Social Support	6.212	.730	4.207	1.282	3.550	1152
	Frequency	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Age						
18–20	10	10.53%	3	5.17%	8	17.02%
21–23	12	12.63%	7	12.07%	11	23.40%
24–26	14	14.74%	10	17.24%	8	17.02%
27–29	17	17.89%	8	13.79%	4	8.51%
30–32	24	25.26%	13	22.41%	9	19.15%
33–35	18	18.95%	17	29.31%	7	14.89%
Gender						
Male	43	45.26%	36	62.07%	31	65.96%
Female	52	54.74%	22	37.93%	16	34.04%
Current Living Arrangements						
Living alone	13	13.68%	11	18.97%	13	27.66%
Living with family	60	63.16%	43	74.14%	28	59.57%
Living with others	22	23.16%	4	6.90%	6	12.77%
Employment Status						
Employed working full-time	43	45.26%	24	41.38%	20	42.55%
Employed working part-time	23	24.21%	12	20.69%	8	17.02%
Employed working in a casual position	16	16.84%	7	12.07%	4	8.51%
Employed in a paid internship	1	1.05%	0	0.00%	3	6.38%
I am a volunteer, not looking for paid work	0	0.00%	2	3.45%	2	4.26%
I am a volunteer and looking for work	2	2.11%	4	6.90%	3	6.38%
Main Form of Transport Used						
Train	22	23.16%	19	32.76%	21	44.68%
Bus	26	27.37%	21	36.21%	20	42.55%
Ferry	1	1.05%	2	3.45%	8	17.02%
Tram	6	6.32%	7	12.07%	5	10.64%
Car driver	50	52.63%	17	29.31%	13	27.66%
Car passenger	42	44.21%	21	36.21%	15	31.91%
Taxi/Uber	17	17.89%	12	20.69%	7	14.89%
Motorbike or motor scooter	1	1.05%	5	8.62%	1	2.13%
Power wheelchair or mobility scooter	3	3.16%	2	3.45%	3	6.38%
Bicycle	1	1.05%	4	6.90%	5	10.64%
Walk only	7	7.37%	5	8.62%	5	10.64%
Work at home	2	2.11%	3	5.17%	3	6.38%

Motivated and Supported ($p < .001$), *Moderately Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$) and *Highly Motivated and* Supported and *Moderately Motivated and* Supported ($p < .001$). These results suggested that *Highly Motivated and* Supported perceive they have more behavioural control over being independent in their journey to the workplace than *Moderately Motivated and* Supported, who perceive more control than *Lowly Motivated and* Supported.

4.2.2.4. Behavioural intentions. A one-way ANOVA with post hoc tests (Tukey) was then undertaken to examine behavioural intentions of the clusters. It was identified that a significant difference was present across groups, $F(2, 199) = 103.840$, $p < .001$ with *Highly Motivated and* Supported producing the highest intentions (M = 6.313), followed by *Moderately Motivated and* Supported (M = 5.013) and then *Lowly Motivated and* Supported (M = 3.436). The post hoc tests identified a significant difference between *Highly Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$), *Moderately Motivated and* Supported and *Lowly Motivated and* Supported ($p < .001$) and *Highly Motivated and* Supported and *Moderately Motivated and* Supported ($p < .001$). These

results suggested that *Highly Motivated and* Supported had higher intentions to being independent in their journey to the workplace than *Moderately Motivated and* Supported, who had higher intentions than *Lowly Motivated and* Supported. This aligns with expectations as the Theory of Planned Behaviour proposes attitudes, subjective norms and perceived behavioural control all contribute to one's intention to perform a behaviour. Therefore, it was expected that *Lowly Motivated and* Supported (*Highly Motivated and* Supported) would have the lowest (highest) intentions as they had the lowest (highest) attitudes, subjective norms and perceived behavioural control.

4.2.2.5. Behaviour. A one-way ANOVA with post hoc tests (Tukey) was then undertaken to examine if the cluster segments differed significantly based upon their actual behaviour. It was identified that a significant difference was present across groups, $F(2, 199) = 43.137$, $p < .001$ with *Highly Motivated and* Supported producing the highest past behaviour of being independent (M = 5.721), followed by *Moderately Motivated and* Supported (M = 4.466) and then *Lowly Motivated and* Supported (M = 3.223). The post hoc tests identified a significant difference between

Table 5. Construct measurement summary.

Construct	Factor Loading	AVE	C.R.
Attitude		.648	.948
Useless-Useful	.835		
Ineffective-Effective	.854		
Foolish-Wise	.791		
Unpleasant-Pleasant	.796		
Boring-Interesting	.720		
Unenjoyable-Enjoyable	.762		
Punishing-Rewarding	.809		
Disadvantageous-Advantageous	.851		
Stupid-Smart	.869		
Unattractive-Attractive	.751		
Subjective Norms		.831	.936
People who are important to me would want me to be independent in getting to work	0.903		
People who are important to me would approve of me being independent in getting to work	0.922		
People who are important to me would encourage me to be independent in getting to work	0.909		
Perceived Behavioural Control		.825	.934
It would be easy for me to be independent in getting to work	0.922		
If I wanted to it would be easy for me to be independent in getting to work	0.902		
I have full control over being independent in getting to work	0.900		
Behavioural Intentions		.820	.948
Within the next four weeks, I will definitely be independent in getting to work	0.907		
Within the next four weeks, I absolutely intend to be independent in getting to work	0.917		
Within the next four weeks, I will certainly make an effort to be independent in getting to work	0.889		
Within the next four weeks, I am planning to be independent in getting to work	0.909		
Past Behaviour		.922	.959
How often in the past two weeks were you independent in getting to work	.960		
How often were you independent in getting to work in a typical 2-week period over the past six months?	.960		

Table 6. Means, Correlations, Shared variances and AVE for TPB.

Construct	AVE	Attitudes	Subjective Norms	Perceived Behavioural Control	Behavioural Intentions	Past Behaviour
Overall						
Attitudes	.648		.537	.352	.441	.238
Subjective Norms	.831	.733**		.500	.621	.318
Perceived Behavioural Control	.825	.593**	.707**		.640	.542
Behavioural Intentions	.820	.664**	.788**	.800**		.513
Past Behaviour	.922	.488**	.564**	.736**	.716**	
Mean		5.456	5.521	5.046	5.250	4.882
SD		1.263	1.498	1.590	1.591	1.765

Note: **p < .01.

Highly Motivated and Supported and Lowly Motivated and Supported ($p <$ .001), Moderately Motivated and Supported and Lowly Motivated and Supported ($p <$ .001) and Highly Motivated and Supported and Moderately Motivated and Supported ($p <$ .001). Consistent with predictions and the reasoning for intentions, these results suggested that Highly Motivated and Supported were more independent in their journey to the workplace in terms of past behaviour than Moderately Motivated and Supported, who were more independent than Lowly Motivated and Supported.

5. Discussion and conclusion

With a strong societal norm to work and known self-fulfilment through employment, there is inherent interest in getting people into the workforce. Individuals with physical disabilities are known to be one group of society which often face additional barriers to employment (Lindsay et al., 2017, 2019). Therefore, the aim of this study was to identify meaningful and accessible segments of the young adults with a physical disability population, utilising psychosocial and sociocultural factors, and develop further understanding of how these segments could be targeted to increase their independence in their travel to work through the application of the Theory of Planned Behaviour.

Three segments were identified: 1) Highly Motivated and Supported, 2) Moderately Motivated and Supported, and 3) Lowly Motivated and Supported. The Highly Motivated and Supported segment had the highest levels of desire and social support to being independent in their journey to work. This then translated to these individuals having statistically significantly higher positive attitudes, subjective norms, perceived behavioural control and intentions to being independent in their travel to work. They also reported the highest levels of actual past behaviour. These results reflect the Theory of Planned Behaviour which posits that behaviour is a function of the most salient information or beliefs relevant to the behaviour (Ajzen, 1991). The more an individual believes they can

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complete the behaviour the more likely they are to do so. The results of the current study support this with the finding that over half of this highly motivated and supported segment reported driving their own car as their main form of transport to work demonstrating their independence. Due to this segment having the highest positive attitudes, subjective norms, perceived behavioural control, intentions and past behaviour to travel independently to work, it is concluded that these individuals are already displaying the required behaviour and therefore, strategies which commend these individuals on their behaviour and encourage its continuation are recommended.

The *Moderately Motivated and* Supported segment demonstrated moderate levels of desire to travel to work independently and moderate social support. These accompanying sociocultural and psychosocial factors in combination with the Theory of Planned Behaviour provide framing for supporting this group of individuals into the workforce (Abbott and Carpenter, 2014; Lindsay et al., 2017). When applying the Theory of Planned Behaviour, it was identified this segment had lower attitudes, subjective norms, perceived behavioural control, intentions and demonstrated behaviour than the *Highly Motivated and* Supported segment however, higher than the *Lowly Motivated and* Supported segment. The challenge is how to ensure the consistency between intention and behaviour (Ajzen, 1991). Often even though individuals have the intention to complete a specific behaviour, they may not in fact follow through with it. This segment of individuals who have a medium level of motivation and support may not complete the behaviour even though they initially intended to do so. Factors such as disruptions or timetabling challenges may interrupt the individual's initial plans. Lindsay (2019) also identified the importance of enhancing access by way of better support on public transport and shared accessible vehicles as potential solutions to this type of challenge. This finding was reinforced by the fact that over a third of this segment utilised public transport (either train or bus) to travel to work, and over a third relied on others by being passengers in a car. Improved efficiency and access are potential paths to help ensure the transition from intention to behaviour for this group (Ajzen, 1991; Lindsay, 2019). The *Lowly Motivated and* Supported segment had the lowest desire and social support of independent travel, and this translated to significantly lower attitudes, subjective norms, perceived behavioural control, intentions and demonstrated behaviour than any other group. When individuals face negative attitudes, they are more likely to abandon their employment aspiration (Shaw et al., 2006) and their likelihood of employment success depends on the level of support they receive from their friends and family (Carter et al., 2012). Therefore, it is recommended that strategies be developed that target each of the components (attitudes, social norms and perceived behavioural control) of the Theory of Planned Behaviour to encourage the *Moderately Motivated and* Supported and *Lowly Motivated and* Supported segments to increase their intentions and actual behaviour to travel independently to work more frequently. It is important to note here that this study is not inferring that by addressing these factors that all of the challenges for individuals with a disability travelling independently to work will be solved. It is however, suggesting that understanding and addressing these factors may contribute in addressing such challenges.

In terms of strategies to target and increase attitudes, campaigns which change these individual's attitudes so that they are more positive about travelling independently to work are required. For example, a multi-channel campaign (digital and traditional methods) which highlights the support which is available on public transport for young adults with a physical disability may assist in changing these individual's attitudes to travelling independently as they may feel more comfortable that support is available if required (Lindsay, 2019). To target social norms, it is important that young adults with a physical disability feel socially accepted when they travel independently and, that their friends are travelling independently as well to highlight this behaviour as a social norm. As such, a campaign which targets these two factors is required. This type of campaign can also be targeted at the broader population to also encourage them to support people who may be encountering issues

on public transport or in transit on their journey. This idea is also in keeping with Lindsay (2019) who identified the need for transport staff and public to be diversity and disability aware and inclusive in their approach. To add the support notion, the creation of peer-to-peer networks surrounding transport and other journey tools should be encouraged which was also identified by Lindsay (2019). Disability support has previously been face-to-face support (Lindsay, 2019) but it is increasingly developing into peer-to-peer support networks (Mcloughlin et al., 2019). By having networks of people being able to provide real time advice and information about the journey should help in not only the planning but also the ability to alter access if issues are encountered. This type of societal support would engender greater involvement and appreciation of the challenges faced but also highlight the success when achieved. Map systems such as Waze, which functions like a crowdsourced social network, provides directions as well as live community feedback. This type of system could be integrated to support users with physical disabilities in their journeys. With the introduction of wheelchair access into Google Maps systems in limited cities across the world, this functionality is not too far away on a large scale.

To provide further empowerment and self-belief of young adults with physical disabilities travelling to work, transport operators and other organisations should highlight travel/journey planning information and booking service information whether this be in the form of an app for a mobile phone or a website. This supports the ideas purported by others that apps, GPS, and technology facilitated services provide a great deal of opportunity for young people with disabilities (Lindsay, 2019; Price et al., 2018). This information should also include alternative routes with information about the physical environment including road works, building works, or terrain, to aid planning and to provide alternative solutions when the original plan is untenable.

Finally, to address the lower perceived behavioural control factors for the *Moderately Motivated and* Supported and *Lowly Motivated and* Supported segments, the availability of infrastructure to support these individuals in their independent travel needs to be reviewed. These individuals report not having the behavioural control to travel independently and as such, tactical strategies need to be developed to assist with this.

One way to help develop behavioural control, which also aids with self-belief and empowerment is by educating individuals in a safe environment. By combining real-world views and digital information, individuals can gain real-time supports and guides to increase their independence and skills. Virtual reality alongside augmented reality are promising for people with disabilities (McMahon et al., 2015, 2019; Norouzi et al., 2019). Virtual reality headsets supplied by transport operators or city councils could provide individuals with environments which enable them to learn about transport options, route planning and alternative seeking in a safe and controlled environment. This could help develop behavioural control as by providing them knowledge about the environment prior to their actual experience with the journey could help determine whether the individual feels they have the control to perform the behaviour (Ajzen, 1991); in this instance travelling to work independently. This provision of risk-free experiences enables individuals to expand their knowledge about likely scenarios encountered on their journey and provides them with opportunities to learn those that were previously unachievable. Furthermore, this type of technology can also be used by transport operators, architects and city planners to understand the likely challenges faced by individuals with physical disabilities on their journey. While many countries have disability standards built into their building codes (e.g. Australia; US, UK), the ability to develop as much of a 'lived' understanding of a physical disability as possible, is likely to prove beneficial for design elements. This expanded experiential knowledge helps to create empathy and can aid with inclusive development and design of buildings, public spaces and transport options.

While this research investigated the journey to work through the experiences of individuals with physical disabilities, this study utilised a quantitative approach to its investigation which while making the results more generalisable, can limit the richness of the data collection (Creswell

and Creswell, 2017). To overcome this limitation and to further explore the results identified in this research, qualitative research such as critical incident technique, or a lived experience, phenomenological study, could be used to fully appreciate the challenges faced by young people with physical disabilities in their journey to work. Critical incident technique collects observations from individual's behaviours and helps classify them with the aim to address practical problems (Flanagan, 1954). This could be useful to appreciate the daily challenges faced in the journey to work which could be used to further inform policy around transport, public space utilisation and building codes. Further limitations included data collected only in one country and with young people with physical disabilities. Future research should look to expand this research in other cultures, and with other people with disabilities beyond physical disabilities and a wider spread of ages.

This study identified three meaningful and accessible segments of the young adults with a physical disability' population utilising psychosocial and sociocultural factors. It then developed further understanding of how these segments could be targeted to increase their independence in their travel to work through the application of the Theory of Planned Behaviour. In doing so this study made three contributions. First, this study segmented the young adults with a physical disability population. This was a significant contribution as previous research had identified this as a heterogenous population (Abbott and Carpenter, 2014; Huang et al., 2013; Lindsay et al., 2017) however, no research had examined this population in more detail to identify the similarities and differences that were present between the individuals. Future research will be able to utilise the segmentation approach and segments identified, to examine this population in more detail. Second, this study applied the Theory of Planned Behaviour to identify differences across the segments. Although being utilised significantly in other literature bases (Ajzen and Driver, 1992; Conner and Armitage, 1998; Daellenbach et al., 2018; Parkinson et al., 2018), the Theory of Planned Behaviour is very limited in its application in the employment and disability literature. As such, this study provides significant insight into how strategies and policies can be developed for behaviour change in these contexts utilising the theory's proposed constructs. Finally, this study developed actionable strategies which can be utilised to increase the independence of young adults with physical disabilities in their travel to work. Before this study, there had been limited investigation into this area of research and how these strategies could assist with the transition into the workforce.

Declarations

Author contribution statement

Amanda Beatson: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Aimee Riedel: Analyzed and interpreted the data; Wrote the paper.

Marianella Chamorro-Koc, Greg Marston, Lisa Stafford: Conceived and designed the experiments.

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