The antecedents of loneliness in older people with an intellectual disability

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ABSTRACT

Introduction: The cognitive discrepancy approach to loneliness is often used to describe loneliness in ageing populations, but to date, it has never been used to explore loneliness in older people with an intellectual disability. An analysis is needed utilising a refined list of causes of loneliness in this population.
Method: Using data from a nationally representative dataset of people aged over 40 with an intellectual disability (N = 708), this analysis runs repeated regressions of variables grouped into conceptual blocks, organised from sociodemographic to network quality.
Results: Variables selected predicted 23% of the loneliness variance. Functional limitations, education, working in the community, transport difficulties, pain, stress caused by service change, emotional health problems and confiding were all significant predictors of loneliness.
Conclusion: That for those with fewer functional limitations only transport difficulties precipitated loneliness, suggests living a more independent life protects from loneliness, in this group. Those with functional limitations and who lead a more service dependent life appear more exposed to loneliness precipitating variables.

What this paper adds

This is the first paper to systematically produce a list of the causes of loneliness in older people with an ID. Using a large dataset, and statistical modelling techniques employed in studies of the broader population. To create the list of antecedents, this paper was the first to use a recognised approach to understanding loneliness. Using a standardised approach adds benefit to both those interested in ID research and those researching loneliness, in general, adding new knowledge about loneliness in people with an ID and it further refines what is known about loneliness in very specific circumstances. This list of antecedents demonstrates that the separated lives this population has lived influenced which events will precipitate loneliness. Using this approach establishes that functional limitations are the primary predisposing element influencing the education and working life of people with an ID. This research adds an understanding of the importance of pain in isolating people from their friends and family, and the significance of people having good transport availability. While the role of confiding in protecting from loneliness has been understood in research this is the first research to find that the recipient has to be someone who can aid in the life of the individual. This research is also the first research in this population to link mental health difficulties to loneliness.

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1. Introduction

Loneliness is an aversive condition that increases the risk of ill health and premature death in older people (Cacioppo & Cacioppo, 2014; Hawkley & Cacioppo, 2010). There is a growing body of knowledge about loneliness in older people in the broader population, however very little is known about loneliness in older people with an Intellectual Disability (ID). Research suggests that people with an ID are lonelier than the general population (McCarron et al., 2011; Stancliffe, Wilson, Bigby, Balandin, & Craig, 2014) and are therefore at higher risk of experiencing the adverse outcomes of loneliness. This paper is the first to use a large dataset to systematically analyse the conditions and events that lead to loneliness in people with ID.

1.1. Antecedents of loneliness in old age

The cognitive discrepancy approach (CDA) to loneliness claims the antecedents of loneliness can be divided into predisposing factors and precipitating events (Perlman & Peplau, 1998). Predisposing factors to loneliness in old age put people at risk of loneliness but do not necessarily cause it (Burholt & Scharf, 2013). Predisposing variables include age, gender, education, living environment, (Burholt & Scharf), living with adult children (Wenger & Burholt, 2004) changes to community, health (Victor, Scambler, & Bond, 2008), expectations of loneliness in later life (Pikhartova, Bowling, & Victor, 2015; Victor, Scambler, Bowling, & Bond, 2005), marital status, and having a limited income (Drennan et al., 2008).

Precipitators of loneliness in old age represent a disruption to the established way of life (Pikhartova, Bowling, & Victor, 2014; Victor et al., 2008) that can be a single disruptive event or a build-up of smaller events (Jylhä, 2004; Victor et al., 2008). The single most significant event that precipitates loneliness is the loss of one's spouse or partner, (Aartsen & Jylhä, 2011). Loss of a partner effects people on several levels, they lose their emotional attachment, their confidant, and part of their social functioning (Weiss, 1973). Once widowed, nearly 50% of older people initially report becoming lonely, but over half recover from their loneliness over a ten-year period (Victor, 2014). In old age, loss of health can lead to either a dramatic, or a slow, creeping functional decline. Similarly, a person becoming a carer for their partner may precipitate another loss of social contact, and increase the possibility of loneliness (Wenger & Burholt, 2004). Functional decline may lead to loss of friends from the social network, reducing the available social network (Cacioppo & Patrick, 2008; Pikhartova et al., 2014; Victor et al., 2005).

1.2. Loneliness and intellectual disability

Three factos divide people with an ID from the broader population; segregation (Health Service Executive, 2011), uniformity (McCausland, 2015) and service change (Bigby, 2004). Many people with an ID have been segregated from the broader community, having spent significant parts of their lives living in institutions (Health Service Executive). Separation means their relationships, expectations of ageing, and experiences may be different to the wider community, and thus the causes of loneliness, may equally be different.

To date, there has been minimal investigation of the experience of loneliness in the lives of older people with an ID. Research is complicated by the uniform nature of education, employment and incomewhich limits the potential for refined analyses (McCausland, 2015). Nevertheless, the available data does not support that the precursors to loneliness found in the general population, such as age, gender and relationship status predict loneliness in the ID population (McGlinchey, McCallion, Burke, Carroll, & McCarron, 2013; McVilly, Stancliffe, Parmenter, & Burton-Smith, 2006). Loneliness in this population is likely more influenced by society's negative expectations of this group, ID specific limitations and a lack of an independent social life (Gilmore & Cuskelly, 2014).

Many people with an ID are dealing with significant changes in service provision, which may have the unintended effect of isolating them from longstanding friendships and relationships (Bigby, 2004). The process of re-introducing people with an ID into the general population has also been found to create at least an initial increased sense of loneliness because once out in society they feel their differences more acutely (Broer, Nieboer, Strating, Michon, & Bal, 2010).

1.3. Antecedents of Loneliness for older people with an ID

1.3.1. Predisposing elements

Whilst little research has been conducted, social stigmatisation, isolation, and limited choice have been described as the most significant influence on loneliness for this population (Gilmore & Cuskelly, 2014). People with an ID are often viewed as different, deviant and unpredictable; (Gilmore & Cuskelly). The Resulting segregation from the broader community leads to limited social opportunities in areas such as income, access to relationships (Gilmore & Cuskelly), and choice (Barron, 2001).

Within the ID population more females are likely to report loneliness (McCarron et al., 2011; McCausland, McCallion, Cleary, & McCarron, 2016; McVilly et al., 2006), but being female has not been found to be predictive of loneliness (McGlinchey et al., 2013; McVilly et al., 2006). The amount of support a person requires does predict loneliness (McVilly et al., 2006) and those with more severe limitations, are more likely to live in a residential setting (McCarron et al.). Living in a residential setting restricts contact with friends, wider society (Kozma, Mansell, & Beadle-Brown, 2009), family (Stancliffe et al., 2010) and private personal space (Hughes, Redley, & Ring, 2011). People with an ID are more likely to be reliant on others for transport or be reliant on difficult to access public transportation (Bane et al., 2012), thus restricting a persons ability to socialise as they wish.

1.3.2. Precipitating events

Despite the limited knowledge about which events create the discrepancy between the desired and actual social life for older people with an ID, there is evidence that relationships and social activities are critical. Family and friends are crucial in the lives of people with an ID, and poor quality relationships may precipitate loneliness (Bane et al., 2012; Money, Friends & Making Ends Meet Research Group c/o Liz Tilly, 2012). Less contact with family and friends means a higher likelihood people in this population will be lonely (McVilly et al., 2006; Stancliffe et al., 2010). Consistent with general population loneliness theories, the quantity and quality of contact within the network appear to influence loneliness fundamentally (McVilly et al., 2006). The least lonely in the McVilly et al. study were those with consistent long-term friendships and a best friend who was another person with an ID. In the same study lonelier participants indicated their relationships failed to meet their emotional and practical needs.

Social participation rates have been reported to be lower than for the general population in some studies (McCausland, 2015) and higher in others (Lippold & Burns, 2009). Within the Intellectual Disability Supplement to The Irish Longitudinal Study on Ageing (IDS-TILDA) half of the participants were found to engage in five or more community-based activities a month, yet only 1 in 4 activities were with members of the broader community, suggesting that interaction with the broader community is limited (McCausland). Therefore, restricting a persons chance to develop new relationships.

Taken together the limited literature on loneliness in people with ID suggests that there are both similarities with the general population and some crucial differences, but unlike the general population, there has been no theoretical consideration of loneliness to guide further research.

The CDA model argues that for loneliness to occur there must be a mismatch between a person's desired and their achieved social life (Perlman & Peplau, 1998). Successful analyses undertaken in the wider population conceptualised predisposing and precipitating variables into logical groups (Hawkley et al., 2008). Each group was sequenced from those distal to the person to those most proximal. Each block was subject to linear regression; significant predictor variables were retained and added to the next block until they lost their predictive ability. Hawkley et al. found that distal variables influence the role of the proximal variables, i.e. distal socioeconomic variables, such as education, influence proximal social variables such as network satisfaction through relationship taxing variables such as social stress.

The research here aims to similarly explore the antecedents of loneliness in older people with an ID by initially using the same methods as Hawkley et al. (2008). The key research question was "what are the antecedents of loneliness for older people with an ID?" After replicating the Hawkley et al. analysis, additional variables drawn from the ID literature already cited were added to the analyses.

2. Methods

2.1. Participants

This study utilised data on participants from wave two of the IDS-TILDA dataset (N = 708). The IDS-TILDA dataset is the world's only longitudinal study on the health and well-being of adults with an ID, linked to a national general population study of ageing, in this case The Irish Longitudinal Study on Ageing (TILDA) (Kenny et al., 2010). The sample for the IDS-TILDA was drawn randomly from the National ID Database (NIDD). The NIDD is managed by the Irish Health Research Board and collects information on all people in the Republic of Ireland with an ID who receive services from the state (Health Research Board, 2015). The database at study commencement had 26,066 participants of all levels of disability, and across all living circumstances (McCarron et al., 2011).

Recruitment of participants to the IDS-TILDA study commenced in 2010 and details on the recruitment, returns and procedures for wave 1 were described in McCarron et al. (2011). Wave 1 yielded 753 participants. Wave 2 of data collection was undertaken in 2013 and participant retention and interview procedures were described in McCarron et al. (2014).

2.2. Ethical consideration

Ethical Approval was granted by the Faculty of Health Sciences at Trinity College Dublin and by 138 service providers throughout Ireland.

2.3. Data collection

Data collection methods for wave 1 were previously described in McCarron et al. (2011) and for wave 2 in McCarron et al. (2014).

2.4. Measures

Data were used from a broad range of sections within the IDS-TILDA protocol covering demographics, socio-economic status, cognitive health, physical health, mental health, social participation, social network and IADL.

2.5. Loneliness and social connectedness

The loneliness and social connectedness scale consisted of seven questions, including the Three-Item Loneliness Scale (Hughes, Waite, Hawkley, & Cacioppo, 2004) and a self-labelling loneliness item. The three-item loneliness scale was based on the UCLA

Table 1

Demographic breakdown of participants answering the loneliness scale.

		Wave 2 Statistic	%
Age		56.16	
	95% CI Lower	55.22	
	95% CI Upper	57.11	
Gender			
	Male	129	40.7
	Female	188	59.3
Level of ID			
	Mild	119	37.5
	Moderate	154	48.6
	Other	44	13.9
Living Circumstances			
	Family	50	15.8
	Independently	35	11.0
	Community House	144	45.4
	Residential	21	6.6
	Other	67	21.1

loneliness (Russell, 1996) and was designed specifically for use in large surveys. To ensure the questions were simple to understand, each was deconstructed into two parts, first, "Do you ever?" with a yes/no response, and then "how often?", With a three-point response for those who answered yes to the first question. Responses to the scale were collected from those that were able to self-report their feelings (n = 317). Table 1 gives the demographic breakdown of participants who completed the loneliness scale.

There were two categories of independent variables, those that approximated the variables used by Hawkley et al. (2008) and those the ID literature suggested would be antecedents of loneliness in this population.

2.5.1. Series 1, Hawkley et al. (2008) led variables

Demographic Variables were *age* and *gender*. There was one Structural/Socio-economic variable, *Education*. Education was binary coded between participants who said they had completed their junior certificate and those who had not. Health variables were; *Chronic Conditions*, measured following the methodology utilised by (Burholt & Scharf, 2013); *Foot pain*, binary coded to Yes = 1 and No = 0; *General pain*, similarly binary coded; The *Activities of daily living scale* (ADL), consisting of nine questions, such as "do you have difficulty with dressing?" which measure a person's ability to carry out basic daily activities (Fonda & Herzog, 2004); *Instrumental Activities of Daily Living* (IADL) scale which analyses a person's ability toward independent living (Fonda & Herzog,). The Social Role grouping consisted of four variables, all binary coded to indicate the presence of a feature in a person's life, *Spouse, Working in the community, Church Attender* and *Group membership*. The Stress Exposure block included a measure as to whether a person had experienced any significant *life events* in the previous twelve months. Any life event experienced was rated for the level of stress caused and categorised into *relationship stress, service stress* and *social stress*. The Social Network block was analysed with a *Social Network* variable that measured the size and frequency of social contact with family and friends. The matching Network Quality variable was *Confide in spouse* where married participants indicated if they confided in their spouse.

2.5.2. Series 2, ID specific variables

The ID specific variables were divided into conceptual blocks replicating the structure of Hawkley et al. (2008). The Demographic Variables conceptual block consisted of *Functional Limitations* (Fonda & Herzog, 2004), measuring a participant's physical limitations and *Cognitive Ability* was used to indicate the level of intellectual ability, measured using the Test for Severe Impairment (Albert & Cohen, 1992). The Socio-Economic Variables consisted of *Transport*, which indicated transport difficulties and *Living Arrangements*, which specifying a participant's primary residence. The Health variables block included *Falls*, which indicated whether participants had fallen in the last month, and a self-rated measure of *Emotional health*. The Social Role variables were; *Civic Engagement* where participants using a provided list of typical activities indicated if they undertook any of those activities. *Giving Help* and *Receiving Help* where participants indicated if they gave or received help from friends and neighbours and *having friends outside the house*. Stress exposure was measured by asking people if they had any *difficulty doing activities* outside their homes and asking if they *want to do more activities*. Social Network on this occasion was measured by rates of *social participation* again in a defined set of activities. Finally Network Quality included who people confided in and was divided into *Confide in Family, Confide in Friend, Confide in staff* and *Confide in Other*. Additional information on all of the Wave 2 variables is available elsewhere (McCarron et al., 2014)

2.6. Analysis

All analysis was conducted using IBM SPSS v23.0.

Two series of logistic regressions replicated the methodology of Hawkley et al. (2008). As noted previously, the first series contained variables that closely matched those used by Hawkley et al. (2008). The second series of regressions used variables identified in the ID literature as likely to be an antecedent of loneliness in people with ID. In keeping with Hawkley et al. (2008), a significance level was set at a p-value of 0.1 in the previous regression.

Table 2

Significant Hawkley variables (N = 317).

Regression	Variable	B	SE	p	LLCI	ULCI
2a	Education	−0.491	0.216	0.022	−0.894	−0.057
3b	General Pain	0.749	0.210	0.001	0.345	1.148
4b	Working in the Community	−0.443	0.249	0.070	−0.905	0.057
5b	Service Stress	0.301	0.135	0.025	0.042	0.562

In both series of regressions, variables were clustered into conceptual blocks. Variables were initially entered into the regression one block at a time, listed as the (a) regressions. Those variables achieving significance were retained and entered into a secondary regression, (b) regressions. Variables that achieved significance in the secondary regression were retained and added to the variables for the next iteration. Finally, following the methodology of Hawkley et al. (2008), a regression was created with all the variables that had been utilised whether significant or not. Bootstrap Confidence Intervals were set at a level of 5000 cases Bias Corrected and Accelerated.

3. Results

3.1. Series 1, Hawkley et al. (2008) led variables

3.1.1. Correlations

Correlations between variables were checked for collinearity; none were of an order that would cause concern (see Table A1 in Appendix A).

3.1.2. Regression analysis

The significant predictive variables from each block of variables can be found in Table 2. There was no need to carry out secondary regressions 1b, 2b, 6b and 7b.

3.1.3. Regression 1a (Demographics)

Neither age (B = 0.04, SE = 0.10, p = n.s., 95% CI = −0.024, 0.017) nor gender (B = 0.284, SE = 0.178, p = n.s., 95% CI = −0.072, 0.639) were significantly predictive of loneliness. Combined, they were responsible for 0.8% (R^2 = 0.008) of the loneliness variance. Neither variable was retained for further analysis.

3.1.4. Regression 2a (Socio-Economic)

Regression2a (R^2 = 0.014) contained the variable Education (B = 0.491, SE = 0.216, p < 0.05., 95% CI = -0.894, −0.057) which was significantly predictive. Education was retained for the next regression analysis.

3.1.5. Regression 3a + 3b (Health)

Regression 3a (R^2 = 0.073) contained the retained variable and the health variables. General pain (B = 0.651, SE = 0.226, p < 0.01, 95% CI = 0.200, 1.102) was significantly predictive of loneliness. Regression 3b (R^2 = 0.061) contained general pain and education. Education (B = -0.389, SE = 0.214, p = n.s., 95% CI = -0.798, 0.048) failed to reach significance and was excluded from further analysis.

3.1.6. Regression 4a + 4b (Social Roles)

Regression 4a included the retained health variable and the social roles variables and explained 5.7% of the loneliness variance (R^2 = 0.057). Both general pain (B = 0.672, SE = 0.205, p < 0.01, 95% CI = 0.287, 1.064) and working in the community (B = -0.470, SE = 0.258, p < 0.1, 95% CI = 0.975, = .068) reached a p-value below 0.1. Regression 4b (R^2 = 0.047) contained general pain and working in the community, both achieved significance and were retained.

3.1.7. Regression 5a + 5b (Stress Exposure)

In Regression 5a (R^2 = 0.079) general pain (B = 0.718, SE = 0.199, p < 0.01, 95% CI = 0.333, 1.101), service stress (B = 0.347, SE = 0.149, p < 0.05, 95% CI = 0.054, 0.653) and working in the community (B = −0.434, SE = 0.256, p < 0.1, 95% CI = −0.911, 0.094) achieved the p-value lower than 0.1. In regression 5b (R^2 = 0.066) all variables attained the required p-value.

3.1.8. Regression 6a (Social Network)

Regression 6a (R^2 = 0.067) included the retained variables and the social network variable. Only the retained variables achieved the required p-values. No b regression was needed.

3.1.9. Regression 7 (Network Quality)

In Regression 7a (R^2 = 0.066) the retained variables maintained their respective levels of p while spousal confidant failed to achieve the required level.

Table 3

Regression 8, All variables (N = 260).

Stress Exposure					
	B	SE	p	LLCI	ULCI
Age	−0.018	−0.012	0.124	−0.041	0.007
Gender	0.019	−0.193	0.916	−0.358	0.374
Education	−0.341	−0.232	0.148	−0.733	0.080
Chronic Cond	0.054	−0.119	0.645	−0.183	0.299
Foot Pain	0.193	−0.254	0.447	−0.271	0.644
General Pain	0.775	0.226	0.001	0.328	1.283
ADL	0.005	−0.022	0.824	−0.036	0.048
IADL	−0.014	−0.028	0.631	−0.069	0.039
Spouse	1.112	−1.129	0.277	−0.968	3.397
Working in the Community	−0.540	0.324	0.089	−1.174	0.075
Church Attender	0.131	−0.250	0.575	−0.336	0.579
Group Membership	−0.008	−0.192	0.968	−0.369	0.387
Life Events	−0.098	−0.110	0.379	−0.314	0.109
Reln Stress	−0.032	−0.110	0.764	−0.240	0.190
Social Stress	0.191	−0.194	0.323	−0.149	0.489
Service Stress	0.348	0.190	0.071	−0.024	0.722
Social Network	−0.017	−0.065	0.785	−0.150	0.122
Spousal Confidant	−0.889	−0.725	0.138	−2.103	0.654
R^2	0.125				

3.1.10. Regression 8 (Full Regression)

Regression 8 (Table 3) included all the variables. General pain, working in the community and service stress achieved p values of below 0.1. The variance explained was 12.5% ($R^2 = 0.125$).

3.1.11. Series 2, ID specific variables

3.1.11.1. Correlations. Correlation between the predictor variables was checked before running the regressions (see Table B1 in Appendix B). None of the correlations was of a magnitude to cause concerns about collinearity.

3.2. Regression analysis

The significant predictive variables from each conceptual block in the ID specific variables can be found in Table 4.

3.2.1. Regression 1a + 1b (Demographics)

Functional limitations (B = 0.027, SE = 0.016, p < 0.1, 95% CI = −0.003, 0.060) achieved significance and was retained. In regression 1b ($R^2 = 0.015$) functional limitations accounted for 1.5% of the loneliness variance.

3.2.2. Regression 2a + 2b (Socio-Economic)

Regression 2a ($R^2 = 0.059$) included functional limitations and the socio-economic variables. Only transport (B = 0.478, SE = 0.267, p < 0.1, 95% CI = −0.045, 1.026) achieved the required level of significance. Regression 2b ($R^2 = 0.046$), included functional limitations (B = 0.030, SE = 0.015, p < 0.05, 95% CI = 0.001, 0.062), transport (B = 0.517, SE = 0.262, p < 0.05, 95% CI = 0.011, 1.034), and education (B = -0.397, SE = 0.227, p < 0.1, 95% CI = −0.836, 0.061), all three variables achieved the required level of significance and were retained.

3.2.3. Regression 3a + 3b (Health)

Regression 3a ($R^2 = 0.094$) included the retained variables plus the health variables. General pain (B = 0.537, SE = 0.221,

Table 4

Significant ID specific variables (N = 317).

Regression	Variable	B	SE	p	LLCI	ULCI
1b	Functional limitations	0.027	0.257	0.000	4.345	5.351
2b	Transport	0.517	0.262	0.046	0.011	1.034
	Education	0.397	0.227	0.080	−0.836	0.061
3b	General Pain	0.560	0.213	0.008	0.129	0.968
	Emotional Health	0.267	0.126	0.032	0.014	0.505
4b	Working in the Community	−0.621	0.250	0.013	−1.096	−0.123
5b	Service Stress	0.276	0.121	0.025	0.036	0.509
7b	Confide in Staff	−0.497	0.187	0.006	−0.861	−0.132

P < 0.05, 95% CI = 0.102, = 0.970), emotional health (B = 0.266, SE = 0.128, p < 0.05, 95% CI = 0.004, 0.508) and transport (B = 0.439, SE = 0.244, p < 0.1, 95% CI = −0.041, 0.915) achieved significance. In regression 3b (R^2 = 0.092) functional limitations and education failed to reach the required significance level.

3.2.4. Regression 4a + 4b (Social Roles)

In regression 4a None of the social role variables achieved the required level of significance. In Regression 4b (R^2 = 0.077) transport (B = 0.628, SE = 0.224, p < 0.01 95% CI = 0.194, 1.081), general pain (B = 0.493, SE = 0.191, p < 0.05, 95% CI = 0.118, 0.863) working in the community (−0.621, SE = 0.250 p < 0.01, 95% CI = −1.096, −0.123), and emotional health (B = 0.189, SE = 0.109, p < 0.1, 95% CI = −0.023, 0.401) all achieved significance.

3.2.5. Regression 5a + 5b (Stress Exposure)

Transportation (B = 0.563, SE = 0.216, p < 0.05, 95% CI = 0.147, 0.991), general pain (B = 0.408, SE = 0.189, p < 0.05, 95% CI = 0.033, 0.779), working in the community (B = −0.615, SE = 0.282, p < 0.025, 95% CI = −1.168, −0.056), wanting to do more activities (B = 0.780, SE = 0.177, p < 0.01, 95% CI = 0.436, 1.116) and service stress (B = 0.285, SE = 0.121, p < 0.05, 95% CI = 0.051, 0.521) were statistically significant. In regression 5b Emotional health (B = 0.141, SE = 0.104, p = n.s., 95% CI = −0.065, 0.344) failed to meet the minimum required standard and was removed from the future analysis. The regression accounted for 15.4% (r^2 = 0.154) of the loneliness variance.

3.2.6. Regression 6a (Social Network)

In Regression 6a (R2 = all the retained variables attained significance. Social participation (B = -0.007, SE = 0.007, p = n.s., 95% CI = −0.020, 0.007) did not significantly predict of loneliness.

3.2.7. Regression 7a + 7b (Network Quality)

Transportation (B = 0.509, SE = 0.219, p < 0.05, 95% CI = 0.095, 0.953), general pain (B = 0.573, SE = 0.183, p < 0.01, 95% CI = 0.223, 0.935), working in the community (B = -0.636, SE = 0.275, p < 0.05, 95% CI = -1.175, −0.097), wanting to do more activities (B = 0.828, SE = 0.180, p < 0.01, 95% CI = 0.487, 1.195), service stress (0.353, SE = 0.124, p < 0.01, 95% CI = 0.106, 0.594) and confiding in staff (B = −0.479, SE = 0.196, p < 0.05, 95% CI = −0.856, −0.094), all significantly predicted loneliness. The regression explained 17.9% (R^2 = 0.179) of the loneliness variance. In Regression 7b (R^2 = 0.178) all the variables achieved the required level of significance.

3.2.8. Regression 8 (Full Regression)

Regression 8 (Table 5) included all the variables used in the ID specific series of regressions. General pain, wanting to do more activities and confiding in staff were significant predictors of loneliness. Education and service stress were below the p-value of 0.1. The regression accounted for 27.6% (R^2 = 0.276) of the loneliness variance.

Table 5
Regression 8, all ID specific variables (N = 220).

| Network Quality					
	B	SE	p	LLCI	ULCI
Functional Limits	0.004	0.019	0.841	−0.030	0.045
Cognitive Ability	0.008	0.040	0.829	−0.077	0.091
Transport	0.170	0.279	0.565	−0.414	0.766
Residence Family	−0.082	0.304	0.792	−0.687	0.518
Residential	0.147	0.429	0.718	−0.664	0.968
Independent	0.514	0.382	0.176	−0.180	1.284
Other	0.180	0.297	0.544	−0.432	0.720
Education to JC	−0.444	0.261	0.091	−0.952	−0.008
General Pain	0.695	0.222	0.005	0.290	1.077
Falls	−0.025	0.306	0.927	−0.649	0.566
Emotional Health	0.160	0.137	0.253	−0.126	0.412
Working in the Community	−0.446	0.434	0.293	−1.449	0.419
Civic Engagement	0.935	0.783	0.188	−0.390	2.632
Help Neighbours	0.073	0.261	0.779	−0.487	0.619
Friends o/s house	−0.450	0.270	0.110	−0.929	0.032
Help Friends	−0.346	0.234	0.133	−0.784	0.134
Difficulty Doing Activities	0.346	0.245	0.166	−0.128	0.809
Want to do more activities	0.853	0.226	0.001	0.364	1.332
Work Stress	0.316	0.167	0.068	−0.057	0.658
Social Participation	0.000	0.010	0.995	−0.020	0.020
Confide in Staff	−0.645	0.230	0.004	−1.070	−0.212
Confide in family	0.034	0.234	0.881	−0.421	0.439
Confide in Friend	−0.037	0.330	0.897	−0.727	0.675
Confide in others	0.473	0.409	0.219	−0.278	1.429
R^2	0.276				
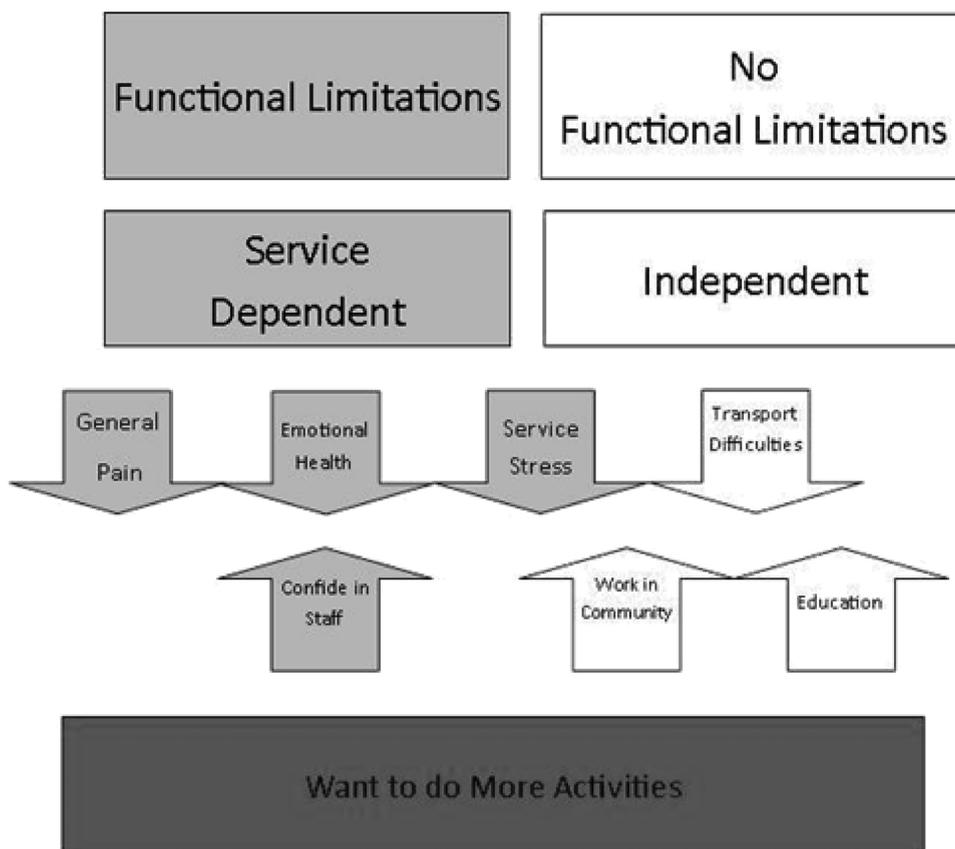
Fig. 1. Antecedents of Loneliness.

4. Discussion

Circumstances and events that prevent older people with an ID fulfilling their social goals lead to loneliness. Perlman and Peplau (1998) divided antecedent variables into two groups: those that predispose a person to loneliness, and those that precipitate loneliness. In older people with an ID, functional limitations were the primary predisposing variable for loneliness. Functional limitations dictated which of the precipitating variables led people to want to do more activities. Functional limitations determined the level of education a person had received and whether they worked in the community, both of which have been shown to protect against loneliness (McVilly et al., 2006). When functional limitations are discussed in the general population (Hawkley & Cacioppo, 2010; Wenger & Burholt, 2004), it is usually as an outcome of declining health (Hawkley et al., 2008; Jylhä, 2004). Discussions of functional limitations in the ID literature instead suggest functional limitations have a more expanded and long-standing links to reduced social integration (Jylhä) and reduced access to choices (Robertson et al., 2001). Functional limitations more specifically define the life chances of older people with an ID in areas such as residence type and the amount of social activity available (Gilmore & Cuskelly, 2014).

As seen in Fig. 1 those with low levels of functional limitations appear protected from loneliness by working in the community and having a good level of education. A central disrupting element to the social desires, of those with low levels of functional limitations, is having transport difficulty. For those with greater functional limitations the primary protection from loneliness is confiding in staff. Experiencing pain, having emotional health difficulties and undergoing service changes that cause stress are events that precipitate wanting to do more activities in those with functional limitations.

The Hawkley et al. (2008) led series of regressions produced antecedents that combined predicted 12.5% of the loneliness variance ($r^2 = 0.125$) in people with ID. The ID-specific variables with significant Hawkley variables combined to predict 27% of the loneliness variance ($r^2 = 0.276$).

Characteristics that are unchangeable are less influential in the loneliness of people with ID. Neither gender nor age were significant predictors of loneliness. Both gender (rho = 0.170, $p < 0.01$) and age (rho = 0.170, $p < 0.01$) were associated with the number of chronic conditions experienced. In the general population, the linkage of age and gender to increased numbers of chronic conditions has been cited as a reason why all three are antecedent to loneliness. However, the number of chronic conditions was also not predictive of loneliness in people with ID. Instead for people with ID a number of variables that are susceptible to influence appeared important: education, working in the community, transportation, general pain, emotional health, service changes, having someone to confide in and social participation.

Education was protective against loneliness matching the findings of Hawkley et al. (2008) and others (Burholt & Scharf, 2013;

Timonen, Kamiya, & Maty, 2010; Victor et al., 2005). Two explanations have been advanced for the role of education in loneliness in the wider population: first, education operates through feelings of competence (Hensley et al., 2012) and second, education affords social opportunity (Hawkley et al., 2008). In people with ID, mainstream education offers feelings of competence and vicarious social skills training, not open to those who do not stay on in education or are in special needs education (Gilmore & Cuskelly, 2014). However, education no longer protected against loneliness if a person experienced pain, pointing out again the primacy of functional limitations since those who experienced pain were more likely to experience functional limitations and similarly those experiencing functional limitations were less likely to have received a good education.

There appeared to be similar complexity in the relationship between working in the community, functional limitations and loneliness. Others have reported on the protective effect of working in the community increases social skills and opportunities for their use (Gilmore & Cuskelly, 2014). It is likely that those with ID who work in the community are those who have the greatest choice about their social lives and therefore have more feelings of control over their circumstances.

Transportation difficulties were particularly pertinent to the more independent living group in the sample (rho = 0.142, $p < 0.05$) and to those working in the community (rho = 0.170, $p < 0.05$). In the general population, lack of transportation has been reported to leave people unable to access social resources (Burholt & Scharf, 2013). For individuals with an ID, transportation difficulties have been previously associated with having difficulty in maintaining and developing relationships (Bane et al., 2012). The findings here confirm both these viewpoints with transportation difficulties leading to this group, in particular, having lower than expected social participation rates.

General pain has been reported for the general population to precipitate loneliness in those with a greater number of functional limitations (Jaremka et al., 2014). Pain was a major contributor to loneliness in this population, explaining 4.7% of the loneliness variance, and when introduced into both series of regressions it remained predictive of loneliness. Chronic pain has been found to be a predictor of severe loneliness in the wider Irish population (Cleary, 2011). Participants with ID in this study who experienced pain were more likely to report having difficulty doing activities (rho = 0.129 $p < 0.05$). Pain experienced can also represent the experiencing of health symptoms (Hawkley et al., 2008) and for people with ID, it may be a better indicator of health (as a predictor for loneliness) than the number of chronic conditions.

The role of service-related stress was pronounced for people with ID. Service changes caused a level of stress that precipitated loneliness in people with ID who were reliant on services. There were mixed results on the role of stressors using Hawkley et al. (2008). Some have found work stress to be predictive of loneliness, and other researchers have found stressors not to be predictive of loneliness (Zebhauser et al., 2014). Service stress has been identified as a measure of how difficult people with ID find service-related changes in the previous 12 months, and represent a loss in personal social resources thereby increasing the chances of becoming lonely (Aartsen & Jylhä, 2011). Service stress in this study was associated with functional limitations (rho = 0.124, $p < 0.05$), with losses felt most by those most reliant on services. The effect of service stress was repeated in both series of regressions and remained a significant predictor of loneliness, adding 2% to the predictive power of the regression. Service stress was also the only stressor that proved to be a significant predictor of loneliness. The findings here appear to be the first to look at the role of the stress caused by changes in service provision for people with an ID and point to the importance of stable service provision.

Emotional health is regularly linked to loneliness in the general population (Aartsen & Jylhä, 2011; Barry et al., 2009; Coyle & Dugan, 2012; Victor et al., 2008). People with emotional health difficulties have trouble adjusting their expectations when changes happen in their social circumstances (Burholt & Scharf, 2013). Emotional health for people with ID lost its predictive ability once the stress caused by service change was introduced into the regression. This loss of predictive ability supports the argument that those with emotional and perhaps other mental health difficulties have trouble adapting to new circumstances.

In other populations having a confidant has been associated with protection against loneliness (Hawkley et al., 2008; Victor et al., 2005). The benefit of using a confidant was less straightforward for people with ID, and confidants were useful if they could initiate changes. Confiding in staff was significantly protective against loneliness and confiding in friends or others was not helpful. Staff may be in more of a position to initiate beneficial change in the lives of older people with an intellectual disability

In analyses of data for older populations, the level of social participation has been regularly associated with loneliness (Lykes & Kemmelmeier, 2014; Russell, Cutrona, McRae, & Gomez, 2012; Victor et al., 2008). While social participation was not predictive of loneliness in this population, wanting to do more activities was, in keeping with the findings of others (Hawkley et al., 2008).

Overall, these findings are in keeping with the CDA (Perlman & Peplau, 1998) and demonstrate how predisposing elements influence the precipitating factors. Fig. 2 shows the primary predisposing elements are functional limitations and subsequently the level of education. The predisposing elements determine which events will precipitate the mismatch between desired and actual social relations causing a mismatch or wanting to do more activities.

4.1. Recommendations for practice

Knowing which variables are antecedent to loneliness in this population will allow service providers to look at their future structures and placements. Particular attention is needed to reduce the adverse effects of functional limitations, with specific efforts being made to find out what life enhancements are necessary to mitigate the risk of loneliness. Transportation is another issue that needs to be addressed, services need to ensure that people with ID who use public transport are trained in its use. Additionally, services which plan living accommodation for those who live independently or semi-independently should ensure they are close to good public transport links.
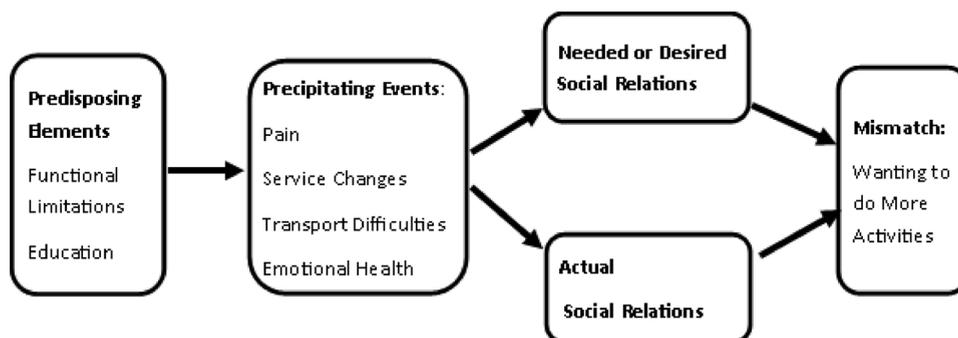
Fig. 2. Updated Antecedents section of the CDA.

Of particular interest to those who organise services should be the protective role of working in the community, education, and confiding in staff and family. Working in the community increases the person's quality of activities and self-worth, and where specific work cannot be located voluntary work should be considered. Voluntary work is known in the general population to be protective against loneliness (Victor et al., 2008).

4.2. Limitations

The amount of the variance explained using the ID-specific variables at 27% is well below the 45% Hawkley et al. (2008) revealed. The variables utilised were limited by the theoretical model chosen, the admittedly sparse literature on loneliness in people with ID and the available variables through IDS-TILDA. Nevertheless, a systematic and wide-ranging study was undertaken, and the findings offer a comprehensive baseline for further work on exploring the antecedents of loneliness for this group

More females than expected were observed in this population compared to the NIDD. The imbalance in genders may influence the outcome as females in this population are more likely to report being very lonely than males (McVilly et al., 2006). McVilly et al. (2006) found that the loneliest in this population were concerned with social connections and friendships, which may have boosted the explanatory power of confiding as a predictive variable (McCarron et al., 2014).

The methodology utilised did not further analyse alternate pathways suggested by the bivariate and multivariate analysis. This was beyond the scope of this manuscript, but Structural Equation Modelling approaches may further illuminate such pathways. Here the use of a repeated regressions methodology has created a detailed list of predictors of loneliness, many of which are susceptible to positive influence.

Finally, this study only included those participants who were able to answer the loneliness questions for themselves, and so those who have severe or profound disabilities were not represented. Future research should investigate methods for assessing loneliness in those unable to answer for themselves.

5. Conclusion

This is the first research to produce a list of antecedents of loneliness in older people with an ID, and to look at the influence of distal variables on more proximal variables within this population. Participants who had fewer functional limitations tend to lead more independent lives. They are more likely to be educated to junior certificate level and work in the community. For this group, transportation problems create the mismatch between desired and achieved social relations.

Participants who were less functionally able relied on service providers. The participants in this group who were more capable and living in residential settings expressed a desire to do more activities. The individuals whose functional limitations lead to increased pain and emotional health problems were most affected by changes in service provision, which precipitates their loneliness. For all groups, confiding in people who can make help initiate change is protective against loneliness.

The results support the premise of the CDA; it is clear that while there are some differences in variables from the general population, the overall structure of antecedents of loneliness is similar for people with ID.

Acknowledgements

Appendix A

Table A1

Non-Parametric Correlations of Variables in the Hawkley et al. (2008) group of filtrations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Age																	
2. Gender	0.094																
3. Education to Junior Cert	−0.144*	0.076															
4. Chronic Conditions	0.280**	0.170**	0.037														
5. Foot Pain	0.100	0.079	−0.062	−0.001													
6. General Pain	0.166**	0.011	−0.114	0.133*	.438**												
7. ADL: Score	0.018	0.063	−0.046	−0.022	0.062	0.151*											
8. IADL Score	0.091	−0.121	−0.112	−0.008	−0.013	0.123*	0.495**										
9. Spouse	−0.035	0.033	−0.056	0.045	0.011	−0.086	−0.070	0.037									
10. Working in Community	−0.072	0.008	−0.027	0.032	−0.025	−0.062	−0.158*	−0.304**	0.074								
11. Church Attender	−0.062	0.024	−0.022	−0.142*	0.088	0.070	−0.018	0.015	−0.053	−0.053							
12. Group Membership	−0.120	0.092	0.006	0.032	−0.022	−0.037	−0.115	−0.146*	0.116	0.032	0.010						
13. Life Events	−0.004	−0.033	−0.118	−0.064	0.091	0.116	0.008	0.063	0.052	−0.054	−0.020	0.095					
14. Relationship Stress	−0.025	0.045	−0.051	−0.005	0.047	0.066	0.050	−0.069	−0.007	−0.041	−0.079	0.158*	0.449**				
15. Social Stress	−0.056	−0.040	−0.115	−0.056	−0.028	−0.059	−0.005	0.014	0.147*	0.008	0.000	0.076	0.356**	0.140*			
16. Works Stress	0.085	0.052	−0.048	−0.059	0.111	0.074	0.038	0.060	0.029	−0.014	−0.022	0.043	0.509**	0.188**	0.211**		
17. Social Network	−0.145*	0.080	0.084	−0.028	−0.082	−0.019	−0.044	−0.125*	0.015	−0.032	−0.004	0.234**	0.092	0.138*	0.103	−0.044	
18. Confide in Spouse	−0.102	−0.007	−0.063	−0.001	−0.005	0.023	0.042	−0.043	0.438**	0.058	−0.060	0.130*	−0.020	−0.087	0.034	0.011	−0.035

* p < .05.
** p < .01.

Appendix B

Table B1

Non-Parametric Correlation of variables in the ID specific group of regressions.

	1	2	3	4	5	6	7	8	9	10	11
1.Functional Limitations											
2. Cognitive ability	-0.258**										
3. Transport	-0.050	-0.010									
4. Live in Community House	0.001	0.166**	-0.160**								
5. Live with Family	-0.149*	0.127*	0.082	-0.395**							
6. Live in Residential	0.153	-0.064	0.011	-0.566**	-0.268**						
7. Live Independently	-0.044	0.205**	0.142*	-0.321**	-0.152**	-0.218**					
8. Education to Junior Cert	-0.030	0.044	-0.049	0.002	-0.012	-0.083	0.128*				
9. General Pain	0.266**	-0.123*	0.080	0.104	-0.144*	0.017	-0.021	-0.106			
10. Fall	0.254**	-0.126*	-0.017	-0.034	-0.010	0.049	-0.005	0.068	0.111		
11. Emotional Health	0.099	-0.095	0.064	0.027	0.008	0.022	-0.083	-0.043	0.130*	0.074	
12 Working in the Community	-0.244**	0.106	0.170**	-0.093	0.105	0.036	-0.025	-0.037	-0.065	-0.087	0.043
13. Civic Engagement	-0.095	-0.153**	-0.009	0.012	-0.062	0.020	0.024	0.025	0.167**	0.006	-0.018
14. Give Help	-0.040	0.095	0.049	-0.160**	0.084	0.035	0.105	0.067	-0.019	-0.012	-0.019
15. Friends O/S House	-0.104	0.125*	0.101	-0.180**	0.141*	-0.030	0.165**	0.074	-0.009	0.039	-0.088
16. Receiving Help	-0.031	0.108	0.015	-0.112*	0.090	-0.040	0.129*	0.027	0.040	0.029	0.009
17. Difficulty doing Activities	0.313**	-0.079	0.077	0.049	-0.070	0.034	-0.044	-0.083	0.143*	0.087	0.149**
18. Wanting More Activities	0.023	0.050	0.088	-0.110	-0.075	0.190**	-0.010	-0.037	0.082	-0.014	0.112*
19. Service Stress	0.124*	-0.089	-0.053	-0.004	-0.109	0.078	0.022	-0.067	0.032	0.016	0.021
20. Social Participation	-0.220**	0.144*	0.038	0.005	-0.041	-0.049	0.109	-0.003	-0.092	-0.164**	-0.164**
21. Confide in Staff	0.021	-0.050	-.070	0.236	0.025	0.025	0.017	-0.060	0.051	-0.025	-0.078
22. Confide in Family	-0.069	0.181**	0.073	-0.132*	-0.102	-0.013	-0.013	0.042	-0.011	-0.055	-0.076
23. Confide in Friend	-0.001	0.070	0.230**	-0.016	-0.023	0.038	-0.003	-0.058	0.073	0.099	-0.042
24. Confide in Other	0.054	0.046	0.142*	-0.139*	0.068	0.051	0.069	0.034	-0.021	-0.001	0.029

1.Functional Limitations
2. Cognitive ability
3. Transport
4. Live in Community House
5. Live with Family
6. Live in Residential
7. Live Independently

Table B1 (*continued*)

	12	13	14	15	16	17	18	19	20	21	22	23
8. Education to Junior Cert												
9. General Pain												
10. Fall												
11. Emotional Health												
12 Working in the Community												
13. Civic Engagement	−0.041											
14. Give Help	0.205**	−0.078										
15. Friends O/S House	0.144*	−0.027	0.233**									
16. Receiving Help	0.146**	−0.073	0.437**	0.209**								
17. Difficulty doing Activities	−0.092	−0.046	−0.010	−0.062	−0.007							
18. Wanting More Activities	0.043	−0.016	0.020	0.148**	0.020	0.104						
19. Service Stress	−0.022	−0.005	−0.050	−0.063	−0.090	−0.053	−0.008					
20. Social Participation	0.064	−0.230**	0.248**	0.188**	0.075	−0.150**	0.163**	−0.057				
21. Confide in Staff	−0.023	−0.049	−0.063	−0.043	−0.071	−0.032	0.016	0.108	0.095			
22. Confide in Family	0.045	0.009	0.001	0.050	−0.010	−0.019	−0.027	−0.069	0.087	−0.241**		
23. Confide in Friend	0.045	−0.054	0.026	0.128*	0.122*	−0.078	0.157**	−0.008	0.116*	−0.073	−0.047	
24. Confide in Other	−0.025	−0.050	0.031	0.050	0.053	0.172**	0.114*	−0.100	−0.036	−0.196**	−0.079	−0.034

* $p < .05$.
** $p < .01$.

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