Longitudinal and Life Course Studies • vol 11 • no 4 • 519–550

Online ISSN 1757-9597 • https://doi.org/10.1332/175795920X15955998470689

RESEARCH ARTICLE

The social relationships of three generations identified as disabled in childhood

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Social isolation and loneliness have received substantial attention for their impacts on well-being and mortality. Both social isolation and loneliness can be experienced by anyone across the life course, but some are more vulnerable than others. One risk factor for poorer social outcomes is disability. We draw on data from three longitudinal studies, the National Child Development Study (Great Britain), Next Steps (England) and the Millennium Cohort Study (UK) to compare social relationships across three generations, born between 1958 and 2000/02 in countries of the UK. We examine social relationships at different life stages and how they differ between those who were and were not identified as disabled when they were teenagers. Adjusting for family background and educational attainment, which are associated with both disability and poorer social outcomes, we identify the long-term consequences of childhood disability for risks of social isolation among the older cohort. For the younger cohorts, we evaluate early indications of such patterns. We find substantially smaller intimate and friendship networks, and lower perceived social support among 50-year-olds who were disabled in childhood. Today's disabled youth and teenagers also experience greater social isolation and risks of loneliness than their non-disabled contemporaries.

Key words disability • social relationships • social isolation • loneliness • life course

To cite this article: Parsons, S. and Platt, L. (2020) The social relationships of three generations identified as disabled in childhood, *Longitudinal and Life Course Studies*, vol 11, no 4, 519–550, DOI: 10.1332/175795920X15955998470689

Introduction

Social isolation and loneliness are associated with substantial negative physical and mental health outcomes (Cornwell and Waite, 2009; Steptoe et al, 2013; Holt-Lunstad et al, 2015). Both social isolation (the lack of objective social networks) and loneliness (subjective feelings of deficiencies in relationships) can be experienced by anyone across the life course. Nevertheless, some people are more vulnerable than others. Economic disadvantage and poorer health are key risk factors for both social isolation and loneliness (Steptoe et al, 2013; Nicolaisen and Thorsen, 2014; Durcan and Bell, 2015; Griffiths, 2017; ONS, 2018a), as is disability. Yet disability is itself strongly associated with socio-economic disadvantage (Priestley, 2001; Jenkins and Rigg, 2004; Maroto et al, 2019); and it can be a consequence as well as a driver of reduced social contacts (Lund et al, 2010). Much work on social support in general and on the influence of social relationships on (disabled) people's outcomes focuses on later life (Berkman, 2000; Dykstra, 2009; Durcan and Bell, 2015; Burholt et al, 2017), making it harder to disentangle how far deficiencies in social relationships are related to more proximate or longer-standing disability and associated economic disadvantage. This means we lack a clear understanding of how far disability independently shapes social relationships and at different life stages.

This paper investigates the extent to which disability identified in childhood is associated with poorer social relationships across the life course. We focus on age-appropriate measures of both more intimate and more extended social networks, as well as subjective indicators of perceived social support, which are associated with loneliness. Such different dimensions of social relationships have been identified as critical for subsequent health and well-being (Berkman, 2000). We control for family background (parental social class) and educational attainment, which are associated with differences in risks of social isolation. We thus aim to isolate the independent consequences of early disability in late middle age, as well as for younger generations.

We use a measure of disability embedded in the social model, related to the interaction between differences in individuals' functionings and their social environment (Altman, 2014). Defined within the school context, disability is evaluated relative to the expectations of the child's cohort. Disability thus represents official judgements on the challenges faced by children in education and their need for compensatory intervention. This contextual measure of disability is not without its limitations, in that it covers a range of disabilities associated with the ability to function effectively in school under different regimes. It is, though, a reflection of the ways in which the limitations or stigma associated with specific impairments are highly sensitive to social context (Powell, 2003; UNICEF, 2013; Altman, 2014). Different conditions are rendered disabling as a result of such social processes. Using a contextual measure offers, moreover, the important benefit for our study that we are able to identify the long- and short-term social implications of being disabled in youth.

Our paper is, to our knowledge, the first attempt to investigate disabled people's social relationships using an antecedent measure of childhood disability. Our findings on the association between disability and social relationships are therefore not attributable to reverse causation, nor affected by the changing incidence of disability across the life course. A further contribution is that we compare three distinct and salient points in the life course: later midlife largely before age-related impacts on social networks have taken effect (Durcan and Bell, 2015; Cotterell et al, 2018); the early 20s when adults are forming and consolidating their enduring social relationships and establishing themselves in work (Janus, 2009); and the teenage years, which is a time when individuals are particularly vulnerable to loneliness and exclusion (Chatzitheochari et al, 2016; ONS, 2018a). Finally, by taking account of background factors associated with both disability and social networks, we are able more precisely to estimate the independent impact of disability.

We find that teenage disability casts a long shadow on the social outcomes of those in later midlife, leading to stark differences in social relationships by age 50. But we also observe that such social impacts of childhood disability are already evident among those in their mid-20s and teenagers.

Background

Social isolation and loneliness

Social contact and companionship are basic human needs, important for individual health and well-being (Heinrich and Gullone, 2006; Holt-Lunstad et al, 2010, 2015; ONS, 2019). The value of social relationships for enhancing health and well-being are well-attested in the literature (for example, Berkman, 2000; Berkman et al, 2000; Beaumont, 2013), with both social isolation and loneliness having negative consequences for morbidity, mortality and broader well-being (Cohen et al, 1997; Wilson et al, 2007; Steptoe et al, 2013; Valtorta et al, 2016). From their review of studies on social relationships, Holt-Lunstad et al (2010) concluded that deficiencies in social relationships were comparable to the risks associated with smoking and obesity.

An important conceptual distinction in the literature is between objective and subjective forms of social relationships. Holt-Lunstad et al (2010) reviewed studies investigating the consequences of both social networks and received and perceived social support, collectively referenced as social isolation and loneliness. While all were relevant for mortality outcomes, their distinction between objective and perceived functional support highlights how objective social integration and perceptions may be separately relevant for well-being. In a subsequent review, Holt-Lunstad et al (2015) distinguished more explicitly between social isolation and loneliness, acknowledging that social isolation and loneliness may be related (Hughes et al, 2004), but that they are distinct concepts (Steptoe et al, 2013).

Social isolation refers to lack of objective social relations: those with few social ties are socially isolated. Markers of social isolation comprise living alone, having limited social networks, and having infrequent social contact (Holt-Lunstad et al, 2015). Loneliness, however, references the subjective sense of a deficiency in one's social relationships. Such a deficiency may stem from the failure of social contacts to provide the level of intimacy desired or from the absence of sufficient people to 'play with' (De Jong Gierveld et al, 2006). Loneliness can thus occur even among those who have measurable social networks (Hughes et al, 2004; De Jong Gierveld et al, 2006; Steptoe et al, 2013). The mechanisms by which social isolation and loneliness affect quality of life therefore differ. For example, in the case of an emergency or a long-term illness, social contact and friendships are associated with increased survival rates, primarily as there is someone to offer support and to be around to aid recovery (Kroenke et al, 2006; Marmot, 2010). By contrast, in a study of older people who reported they felt left out, isolated or lacked companionship, the ability to perform daily activities like bathing, grooming and preparing meals declined relative to people who reported none of these feelings (Perissinotto et al, 2012). Effects of loneliness thus occur more through reductions in self-esteem, while those for social isolation through lower self-efficacy. In terms of proximate causal pathways, however, both social isolation and loneliness are linked to high blood pressure and weaker immune systems (Valtorta et al, 2016).

Whether objective social networks or subjective feelings of loneliness are more relevant for morbidity and mortality risks is contested. Steptoe et al (2013) find that both have strong effects but those of loneliness are fully mediated by other characteristics; while Holt-Lunstad et al (2015) find comparable independent effects on mortality of both social isolation and loneliness. Either way, it is clear that social relationships matter.

While the risk of social isolation tends to increase with age, loneliness is U-shaped by age, with teenagers being especially vulnerable (Qualter et al, 2013). In addition, earlier experiences of deficiencies in social relationships can have both long-term and cumulative effects (Cacioppo and Patrick, 2008). Therefore, those population subgroups more susceptible to both early as well as later limits to their social worlds may merit particular attention. One population that is more at risk of limited social relationships is disabled people. But whether social isolation in later life has its roots in the early years is a question that has not been well explored.

Social relationships and disability

The relationship between social connectedness and disability is bidirectional. Those with fewer sources of social support experience poorer health and higher rates of chronic health conditions (Holt-Lunstad et al, 2015; Valtorta et al, 2016), while disabled people have greater risks of social isolation and loneliness (ONS, 2018a; Lund et al, 2010). Disability is inherently socially experienced: it is in encounters with society that disability manifests and that limitations on functioning in different domains are experienced as disabling (Altman, 2014). Studies have consistently shown that disablism is pervasive in British society (for example, Demos, 2004; IPPR, 2007; EHRC, 2017). One in three disabled adults feel there is substantial disability prejudice in the population (Dixon et al, 2018); and two thirds of respondents to a survey stated they would feel uncomfortable talking to a disabled person (Aiden and McCarthy, 2014). Younger respondents – those aged between 18 and 34 – reported they actually avoided talking with disabled people (Aiden and McCarthy, 2014). The consequences of such negative attitudes for social relationships are compounded by the economic pressures faced by disabled people. The Life Opportunities Survey, a longitudinal survey of disability in Great Britain found that many disabled people struggled to participate in a range of normal daily activities, partly as a result of lack of resources (ONS, 2015).

This raises the question of how far social isolation and loneliness are implicated in disabling processes starting in youth or whether they emerge concurrently with disability and economic insecurity in later life. Evidence is mixed on the extent to which disabled children face weaker social integration than their peers (Hodges et al, 1999; Crawford and Manassis, 2011; Avramadis, 2013). Nevertheless, among children and adolescents, social isolation and loneliness is generally associated with being bullied due to non-conformance in some way; and the prevalence of bullying is significantly higher among disabled children and adolescents (Chatzitheochari et al, 2016). Disabled youth also have more negative social self-concept (Pijl and Frostad, 2010) and feel that they occupy a lower social position (Ruijs and Peetsma, 2009).

Social isolation in childhood is associated with continued isolation in adolescence and adulthood (Durcan and Bell, 2015).

Childhood disability may therefore influence social relationships into and through adulthood. Children with disabilities spend more time within the family home (Beresford and Rhodes, 2008). But as they grow older, they have more difficulty accessing the sources of support and companionship outside of the family associated with transition to adulthood. These include friendships, educational attainment, employment opportunities, partnership and family formation (IPPR, 2007; Jones, 2008; Janus, 2009; Parnell and Bush, 2009; Erickson and Macmillan, 2018; Chatzitheochari and Platt, 2019).

As such, having one's own family – a key source of support, guidance and social engagement (Berkman, 2000; De Jong Gierveld et al, 2006) – may be both particularly important and more likely to be absent for disabled adults. More disabled adults live a single life, whether due to relationship breakdown following later onset of disability, or from never having had a relationship or a long-term partner (Pitzele, 1995; Clarke and McKay, 2008). Disabled adults have as much need as non-disabled adults for intimacy (Anderson and Kitchin, 2000); but a study of disabled people's sexuality found that nearly half of those single were not optimistic about finding a partner (Laxton and Goldsworthy, 2008).

Social contact in the wider community and from leisure activities may therefore hold compensatory importance for disabled people. Yet, here, too, they face obstacles in the form of equal access to recreational facilities, acceptance by others, feeling safe, and physical and financial barriers (Pyer and Bush, 2009). Technology potentially offers a way to reduce social isolation; and getting more disadvantaged groups active online has been a policy aim since the 'Digital Britain' report (BIS, 2009). However, in 2017 one in ten UK households had no internet access, with use being least likely among older, particularly disabled, adults (ONS, 2018b). At the same time, social media can have negative impacts. Adults and children with disabilities can be particularly vulnerable to online abuse (Parliament Select Committee, 2018).

Despite this evidence of deficits in social relationships among disabled children and adults, we still lack understanding of how early life disability impacts adults at later stages in the life course, and how far it is separable from the cumulative impacts of economic disadvantage, with which it is associated. The influence of social isolation and loneliness on the development of chronic health conditions and disability, alongside the ways in which disability onset can disrupt relationships (Singleton, 2012), complicates our understanding of the relationship between disability and social isolation over the life course. We also have little insight into whether impacts differ at different life course stages. In this paper we therefore adopt a life course perspective (Priestley, 2001; Powell, 2003; Erickson and Macmillan, 2018) to extend understanding of the association between disability and social relationships for three generations of Britons born more than four decades apart.

Both the construction of disability and its association with disadvantage are highly contextually contingent (UNICEF, 2013; Altman, 2014). We therefore use a measure of disability highlighting the need for educational support in school – special educational needs – that was applicable when the members of the three cohort studies we investigate were teenagers. While special educational needs relate to disabilities experienced specifically in the context of learning, they have a strong overlap with other ways of measuring childhood disability (Burchardt, 2005; Chatzitheochari and

Platt, 2019), and are considered equivalent from a policy perspective (for example, DfE and DH, 2015). Much literature on childhood disability in the UK employs measures of special educational needs or particular categories of need to attest to the experience of those with specific disabilities (for example, Emerson et al, 2014; Harris and Lord, 2016). For our purposes, the fact that disability was measured in the school context is particularly relevant for our interest in whether the contextual construction of disability has long-standing consequences once children have left school, as well as whether it is linked to disabling social processes within the classroom. We address the following questions,

a Do those who were disabled in adolescence have poorer social relationships at age 50 than their non-disabled peers? And is this consistent across the different domains of social relationships identified in the literature?
b Does a younger cohort of adults who experienced childhood disability face poorer social outcomes at age 25 than their non-disabled peers?
c Do today's disabled teenagers face greater risks of isolation and loneliness than their non-disabled peers?

Data and methods

Data

We use information from three multi-topic, longitudinal cohorts of UK countries, covering respectively Great Britain, England and the UK.

The National Child Development Study

The National Child Development Study (NCDS; University of London, 2012a; 2012b; 2014) is a continuing, multidisciplinary longitudinal study, which takes as its subjects all the people born in England, Scotland and Wales in one week in March 1958 (Power and Elliott, 2006). Information was gathered on 17,415 babies, and there have been nine follow-ups when cohort members were age 7, 11, 16, 23, 33, 42, 46, 50 and 55. In this study, we use data up to age 50. Our analytical sample comprises all who were included in the original birth survey, provided information on disability at age 16 and were still alive at age 50 (n = 12,762).

Given the greater likelihood of disabled participants being lost from the study over this long timescale, whether through non-contact or non-response, we address the problem of missing data (Allison, 2001). With longitudinal data, multiple imputation can be used to address both item non-response (missing data within a wave of data collection) or unit non-response, missing observations or attrition across waves of data collection, resulting in missing information on measures of interest. Our main concern is the latter issue. We therefore use multiple imputation with chained equations to 'fill-in' values of missing items in the variables selected for our analysis, adopting Schafer's data augmentation approach (Schafer, 1997) under the assumption of 'missing at random' (MAR). In order to maximise the plausibility of the MAR assumption we include auxiliary variables in our imputation model. In this instance MAR implies that our estimates are valid if missingness is due to variables (auxiliary or substantive) that were included in our models. All reported analyses are averaged across 20 replicates based on Rubin's Rule for the efficiency of estimation under a reported degree of missingness across the whole data of around 0.20 (Little and Rubin, 2002).

Next Steps

Next Steps follows the lives of 15,770 people born in 1989–90 (University College London, 2018). The study began in 2004 when the young people were in Year 9 (age 13–14) of state and independent schools in England. Cohort members were surveyed every subsequent year until 2010, when they were age 19–20, then recontacted in 2015/16, at around age 25, when 7,707 took part. Of these we have information on disability status at age 13/14 for 7,499, and these comprise our analytical sample. Previous research has shown that attrition over the teenage years, whether through non-response or non-contact, does not differ by disability status for Next Steps (Chatzitheochari and Platt, 2019). We investigated patterns of attrition up to age 25 and again found no differential drop-out by disability status: the proportions disabled in our analytical sample are similar to the rates in the first waves.

Millennium Cohort Study

The Millennium Cohort Study (MCS) is a study of approximately 19,000 babies born to families living in the UK between September 2000 and January 2002, who are followed over time (Plewis, 2007; University of London, 2017a; 2017b; 2019). Data have been collected when the children were aged around nine months, and then ages 3, 5, 7, 11 and 14 (Calderwood et al, 2015). The most recent interview took place during 2017–2018 when the cohort was around 17. We use information from self-completion and parent questionnaires for 11,726 cohort members at age 14. We have information on disability status for 11,534 of these and they form our analytical sample.

For both MCS and Next Steps, all analyses are weighted to adjust for the complex sampling design of the surveys and for non-response in the original sample and across the sweeps.

Variables

Dependent variables: measures of social isolation

Measures of social networks are readily captured in survey data, allowing for indicators of social isolation using commonly fielded measures relating to cohabitation, relationship status, numbers and composition of friends, participation in clubs and social activities and so on. Typically, social isolation is evaluated by looking at those in the bottom of the distribution on such indicators, either separately or in combination (for instance, Greenfield et al, 2002; Eng et al, 2002; Pantell et al, 2012; Steptoe et al, 2013; Valtorta et al, 2016). While scales of such multiple measures (for example, Berkman and Syme, 1979) have analytical benefits and have been regularly used in the literature (for instance, Eng et al, 2002; Pantell et al, 2012), they require surveys to consistently carry the specific scale components, or the construction of variants (Steptoe et al, 2013, for example). In addition, as Eng et al (2002) illustrate, the disaggregated indicators are more straightforward to interpret. We therefore draw on a range of network measures, appropriate to the life course stage of the respondents in the three studies, which we split into the key domains identified as salient in the literature. We dichotomise all our measures into lacking versus not lacking each social relationship. Demographic measures (such as the presence of a partner or of children) are derived from information on household composition.

As a subjective measure that carries social stigma, loneliness is less straightforward to capture than social networks using standard measures typically collected in community surveys (De Jong Gierveld et al, 2006). Scales have been developed using multiple indicators to tap into feelings of emotional and social loneliness (De Jong Gierveld et al, 2006) without direct use of the term 'lonely'. For example, the 6- and 11-item versions of the De Jong Gierveld loneliness scale, include items such as, 'There are plenty of people that I can lean on in case of trouble' and 'Often, I feel rejected' (De Jong Gierveld and Van Tilburg, 2006). Compare also items in the scales of Russell et al (1978) and DiTommaso and Spinner (1993). However, such extended scales are rarely implemented in nationally representative samples covering younger age ranges, despite the rationale to do so (De Jong Gierveld and Van Tilburg, 2010); and none of our three studies contain loneliness scales. Nevertheless, they do contain individual subjective items that pick up feeling unable to rely on others, measures that typically form part of loneliness scales. We therefore draw on these measures as indicators of risks of loneliness.

We outline all the measures in the remainder of this section, and provide full coding details in Appendix Table A1.

Family and relationships

For adults in their 50s (NCDS) we explore differences by disability status in marital status and cohabitation, parenthood, whether their parents are still alive, and if they still live with a parent (overwhelmingly their mother). Comparably, for those in their mid-20s (Next Steps) we examine cohabitation patterns, experience of being in an intimate relationship, whether they have children, have ever had sex, and if they have ever left the parental home.

Friends

We have measures of friendships for all three studies. For the NCDS we include measures of how often they have visited, been visited by, had telephone or written contact with a friend, and whether they had access to a computer to gauge potential online contact with family and friends. For young adults in Next Steps we include how often they meet up with friends; and for teenagers in MCS whether they had a close friend and how much time they spend with close friends in a month.

Activities and going out

Adults in NCDS reported how often they did a range of activities from financially free activities such as tending the garden or going for a walk, to going to the cinema or theatre, watching live sport, or going out for a drink or meal. Similarly, young adults in Next Steps reported how often they played sport or did exercise, went to the cinema, theatre or pub/bar, or had a meal in a restaurant.

Bullying and hate crime

For adults in Next Steps, we have two measures of their experience of name-calling or other verbal abuse and being bullied, gossiped about or ignored. Teenagers in MCS reported their experience of being picked on, insulted or shouted at, physical violence (such as being shoved, hit or slapped) or being hit with a weapon or having one used against them.

Subjective indicators of loneliness

Adults in NCDS reported whether they felt they had someone to count on if they were sick in bed, or to listen to their problems or feelings. Next Steps has a similar measure of how much the young adults felt people were willing to listen to their problems. For MCS teenagers, we have measures of whether there was someone they felt close to, if they had family or friends to help them feel safe and happy, or someone to turn to if they had a problem.

We also have measures of trust for all three studies. While not a direct measure of loneliness, this is a subjective measure of orientations towards others that has shown to be associated with loneliness (Qualter et al, 2013). We therefore include it for completeness and because it offers us a consistent measure across the studies. We distinguish low trust based on a low score for the statement 'most people can be trusted' (NCDS) or that you trust other people (Next Steps and MCS).

Independent variables

Disability

Disability is historically and contextually contingent, depending on how environments are or are not disabling for particular forms of impairment (Barnes and Mercer, 2005; UNICEF, 2013; Altman, 2014). The implications of cognitive, socio-emotional and physical impairments have differed according to time and contexts in their implications for learning and for future opportunities and outcomes (Powell, 2006). Terminology is also temporally specific. For the NCDS, we draw on a measure of disability originally derived to measure 'handicap' among teenagers (Warnock Report, 1978). The Warnock Report laid the ground for the categorisation of children with special educational needs in an attempt to avoid the stigmatising terminology of 'handicap' while facilitating support for disabled children's learning (Norwich, 2019). Thus, in Next Steps and MCS we categorise as disabled all those identified with special educational needs. While special educational needs are not identical with legal definitions of 'disability' there is substantial overlap, and similar policy frameworks are applied to special educational needs and disability (compare Burchardt, 2005; DfE and DH, 2015; Chatzitheochari and Platt, 2019).

With changing educational expectations, the proportions identified with special educational needs expanded (Tomlinson, 2017). Recent figures for England suggest that 14.4% of school-age children have special educational needs (Hutchinson, 2017). In earlier decades, when fewer children were expected to leave school with qualifications or to stay on to post-compulsory education, special needs (or 'handicap') were only identified for a relatively small proportion. For the younger cohorts, we thus further define the smaller proportion who had a 'Statement' of educational needs, later Education Health and Care (EHC) Plans (DfE and DH, 2015), as having *severe disability*. Statements / EHC Plans reflect greater severity of learning needs, and these children receive specific support that clearly marks them out as 'disabled'. The proportions with Statements / EHC Plans in the younger cohorts are comparable to those identified as 'handicapped' in the NCDS.

For the NCDS, we derived our measure of (severe) disability by recreating for the whole sample, the measures used in the Warnock subsample (University of London et al, 2012b; Parsons, 2012). We collapse the seven-category variable into a binary measure of disabled or not (Walker, 1982). For the 15,466 who participated in the age-16 survey, 4.5% men and 2.6% women were identified as disabled, with 4.2% men (n = 271) and 2.6% women (n = 161) in our final analytical sample. Note that teenagers identified with a disability had a higher subsequent mortality rate than those with no disability.

In Next Steps, parents were asked at wave 1 whether the young person (aged 13/14) currently has any special educational needs or disabilities. For those missed at wave 1, the question was repeated at wave 2, and we combine these responses. We excluded the small numbers for whom their educational need was related to speaking English as another language or to being 'gifted and talented' (compare Chatzitheochari and Platt, 2019). In our analytical sample, 13.9% were disabled when at school (18.1% men, 9.7% women) among whom 5.2% were severely disabled (7.7% men, 2.8% women).

In the MCS, we use the information asked about special educational needs when the cohort member was age 14, for comparability with the other studies. We again excluded the small numbers for whom their educational need was related to speaking English as another language or being 'gifted and talented' (compare Parsons and Platt, 2017). In our sample, 10.9% were disabled and among these, 5.6% were severely disabled. Boys were twice as likely to be identified as disabled as girls (14.5% boys to 7.0% girls disabled; 7.9% to 3.1% severely disabled).

Our measures of disability incorporate heterogeneous impairments and conditions. Table A2 in the Appendix shows the different conditions. These cannot, however, be directly compared across cohorts since Next Steps and MCS allow multiple categories; and multiple conditions are both common and an indication of greater severity (Parsons and Platt, 2013). Inclusive disability categories such as we use remain salient for social and economic outcomes, and capture the broader disabling environment and its impact over time in a way that a focus on specific conditions cannot (Powell, 2003; Chatzitheochari et al, 2016).

Other measures

Sex of the child

We distinguish between boys (0) and girls (1).

Parental social class

In the NCDS, family social class was derived from father's occupation measured at the time of birth. In the few cases where there was no father, the occupation of the mother's father was used. Occupations were coded to the *Registrar-General's*

Social Classes, a six-category classification ranging from 'unskilled' to 'professional' occupations introduced in 1913. This has subsequently been replaced with the National Statistics Socio-economic Classification (NS-SeC; Rose and Pevalin, 2003; Rose et al, 2005). Parental occupations in Next Steps and MCS from the first wave were categorised to a reduced eight-category version of the NS-SeC ranging from never worked / long-term unemployed, through routine and semi-routine occupations to higher managerial and professional. The highest category of mother or father is used.

Educational level

Disabled youth are more likely to fall behind academically in childhood (Parsons and Platt, 2017), and to leave school at the end of compulsory schooling with few or minimum qualifications (Wilson, 2003; Burchardt, 2005; Loprest and Maag, 2007; Chatzitheochari and Platt, 2019). Therefore, for NCDS and Next Steps, we controlled for highest academic qualification, grouped to National Vocational Qualification (NVQ) levels. This ranges from no qualifications to NVQ4 or higher. NVQ4 is equivalent to a degree.

Cognitive ability

As the younger MCS cohort had not yet attained formal qualifications at age 14, we used a standardised score from the BAS II Verbal Similarities assessment (Elliott, 1996; Elliott et al, 1997) as a proxy for educational attainment. Verbal similarities provides a measure of 'crystallised intelligence' at age 11 (see further, Connelly, 2013). Cognitive ability is highly correlated with qualifications and with labour market success. It therefore offers an equivalent early measure to educational qualifications to control for the influence of education on adult economic and social outcomes. While cognitive ability is correlated with disability, it is not equivalent to it: children with educational support needs are found across the spectrum of cognitive skills, as are those who are not identified with special educational needs (compare Parsons and Platt, 2017; Chatzitheochari and Platt, 2019). We measure cognitive ability in quintiles of the distribution.

Table 1 shows the covariates by disability status for each cohort

Analytic strategy

For each cohort, we first describe social relationships of those with and without disability in adolescence; and note any significant differences. We do this separately for men and women. We then regress each social relationship measure on disability status, adjusting for sex, parental social class and educational attainment / cognitive ability. For Next Steps and MCS, we estimate two sets of regression models: with the overall measure of disability and then with the measure identifying severe disability status, For ease of interpretation (Mood, 2010; Breen et al, 2018), we report predicted probabilities from the logit models adjusted for confounders. We present the probabilities for each disability status graphically, but only for those outcomes where there was a statistically significant main effect of disability to optimise readability. We provide full model results in the supplementary online materials (Tables S1–3, S6–9

Table 1: Descriptive statistics by disability status

NCDS (N = 12,762)[1]			Next Steps (N = 7,499)[2]				MCS (N = 11,534)[2]			
	No disability (96.6%)	Severe disability (3.4%)		No SEN (86.1%)	Disability (13.9%)	Severe disability (5.2%)		No SEN (89.1%)	Disability (10.9%)	Severe disability (5.6%)
	%	%		%	%	%		%	%	%
Family social class			**Family social class**				**Family social class**			
I or II	17.4	8.9	Prof/Man	12.8	7.8	5.8	Prof/Man	39.2	34.1	29.9
IIInm	11.6	9.7	Intermediate	24.3	19.9	18.3	Intermediate	12.9	8.9	7.4
IIIm	48.3	40.7	Small employers / own account	31.9	31.4	30.1	Small employers / own account	14.9	13.5	11.1
IV or V (inc. non-work)	22.6	40.7	Semi-routine / routine	13.6	12.7	17.7	Semi-routine / routine	18.1	15.6	15.6
			Not in work / long-term unemployed	17.5	28.1	28.1	Not in work / long-term unemployed	14.9	28.0	36.0
Highest qualification at age 50			**Highest qualification at age 25**				**Cognitive ability at age 11**			
None	10.7	50.4	None	6.4	22.6	32.2	Lowest quintile	13.4	35.6	46.5
NVQ1	14.9	22.8	NVQ1	12.3	36.6	35.4	2nd	14.6	15.0	15.5
NVQ2	26.6	15.9	NVQ2	26.0	21.3	18.4	3rd	24.2	20.9	16.0
NVQ3	19.2	6.6	NVQ3	18.1	5.9	5.3	4th	16.4	10.8	9.4
NVQ4+	28.7	4.3	NVQ4+	37.2	13.7	8.7	Highest	31.3	17.6	12.6
							Mean[3]	121.19	109.83	103.62
N (unweighted)	*12,330*	*432*		*6,822*	*677*	*238*		*10,401*	*1,133*	*559*

Notes:

[1] % and N for NCDS are based on imputed sample.

[2] weighted percentages for Next Steps and MCS; severe disability is a subset of disability.

[3] mean ability score, standardised score used in regression modelling.

SEN = special educational needs

and S11–12). Given some observed differences in the raw associations for disabled men and women, we additionally estimated linear probability models to identify any significant interactions between sex and disability for each outcome. Again, these are provided in the online materials (Tables S4–5, S10 and S13). We briefly discuss any significant interactions between sex and disability in the text.

Results

NCDS: social relationships at 50

The NCDS cohort turned 50 in 2008. We look at how life has turned out for those identified as disabled in 1974, more than three decades earlier. Table 2 shows that compared to those not disabled in adolescence, far more disabled men and women were single (23.8% men, 21.4% women compared to 6.1% and 5.2%) – having never married or cohabited – and had also not become a parent (40.3%/39.1% compared to 20.5%/19.3%). A higher proportion of disabled people, especially men, lived with their mother (9% compared to 1.6%); but more disabled adults had also experienced the loss of both parents (39.5% men 48.2% women, compared to 27.9%/30.1%). In terms of contact with friends, more disabled men and women had not visited (42.1%/50.8% compared to 29.2%/26.9%) or been visited by (44.2%/48.7% compared to 38.6%/38.1%) any friend in the last two weeks, nor had any contact by phone or letter (26.6%/32.7% compared to 13.5%/9.1%). Far more had no access to or use of a computer at home (49.1%/56.7% compared to 17.8%/20.3%), reducing options for email contact. The social life of 50-year-old men and women identified with disability in adolescence was also relatively impoverished. Far fewer ever went to the cinema, theatre or sporting event, but perhaps more importantly, far fewer ever went out for a drink (17.8%/30.7% compared to 11.2%/16.4%) or even for a walk (18.1%/17.1% compared to 7.3%/8.1%).

For our subjective indicators, disabled men and women were more than twice as likely to feel that that they did not have someone they could turn to if they were sick in bed (19.2%/23.4% compared to 8.5%/10.3%), nor had someone to listen to their problems. Low trust was also more marked among disabled people.

Many of these differences were still observed after adjusting for parental social class, sex and highest level of qualification in the multivariate models, and with relatively little attenuation (Figure 1). This speaks to the strength of childhood disability in shaping social relationships; and it might indicate that disability is one channel for family background, specifically parental social class, effects. An exception to this pattern was the probability of being married or cohabiting. Disabled people’s lower likelihood of currently living with a partner appeared to be accounted for by their parental social class origins and education. In addition, some differences in social activities were also rendered smaller and statistically insignificant in the models, which might suggest they were impacted by the financial constraints linked to lower parental social class origins and lower educational qualifications. Despite some apparent differences in the descriptive statistics, models with interactions between sex and disability showed no significant differences between men and women, except for disabled men having a greater likelihood of living with a parent at age 50.

Table 2: Social relationships at age 50 by childhood disability status (N = 12,762)

	Men (N = 6,488)		**Women (N = 6,274)**	
	No disability (95.8%)	**Severe disability (4.2%)**	**No disability (97.4%)**	**Severe disability (2.6%)**
	% in category	**% in category**	**% in category**	**% in category**
Family life				
Single (never married / not cohabiting)	6.1	23.8*	5.2	21.4*
Previously married/cohabited	22.1	36.2*	24.3	40.5*
Currently married / cohabiting	71.8	40.0*	70.5	38.1*
Never had children	20.5	40.3*	19.3	39.1*
Living with mother	1.6	9.0*	1.4	4.8
Both parents alive	32.8	21.3*	30.9	16.8*
Both parents dead	27.9	39.5*	30.1	48.2*
Contact with friends				
Has not visited friends in last two weeks	29.2	42.1*	26.9	50.8*
Friends not visited them in last two weeks	38.6	44.2*	38.1	48.7^
No contact with friends by letter or phone in last two weeks	13.5	26.6*	9.1	32.7*
No access or use of computer at home	17.8	49.1*	20.3	56.7*
Social activities				
Never or almost never play sport, go for a walk/swim	7.3	18.1*	8.1	17.1^
Never or almost never go to the cinema	29.9	49.7*	24.5	45.9*
Never or almost never go to the theatre	29.3	56.6*	22.1	52.6*
Never or almost never watch live sport	38.9	57.6*	67.0	80.7*
Never or almost never go for a drink in a pub/club	11.2	17.8*	16.4	30.7*
Never or almost never go out for a meal	1.7	3.7	1.5	3.4
Never or almost never work in the garden	11.6	31.4*	12.9	34.2*
Subjective measures				
Lacks people to count on for help if sick in bed	8.5	19.2*	10.3	23.4*
Lacks people around to listen to problems and feelings	8.8	21.0*	8.1	19.2^
Low agreement that most people can be trusted	49.6	71.0*	47.3	63.7*
N	*6,217*	*271*	*6,113*	*161*

Source: National Child Development Study (NCDS).

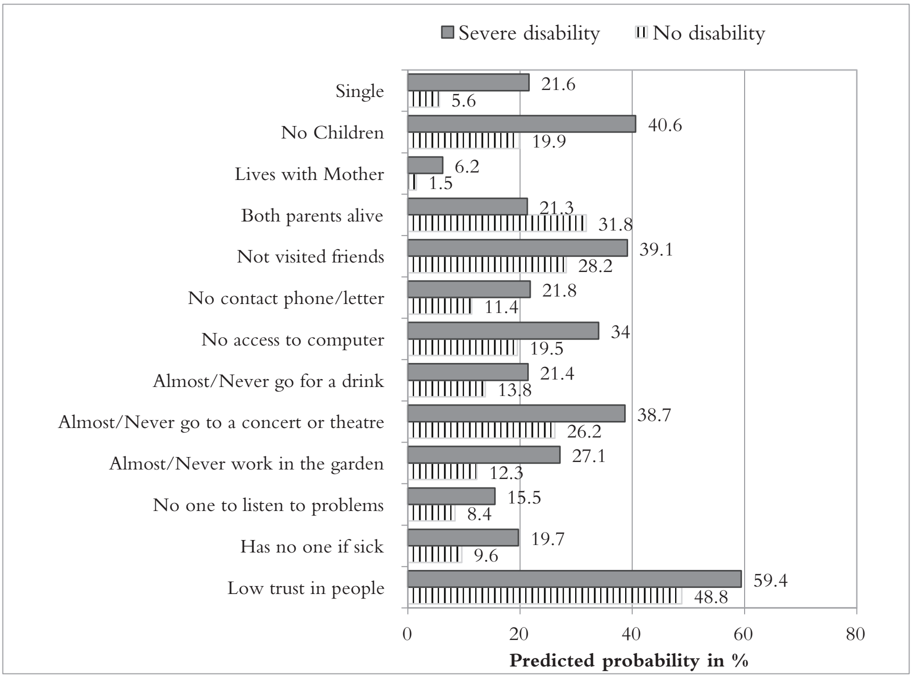
Notes:

* indicates significantly different from children with no disability at $p < .05$.

^ $p < .1$.

All measures represented negative or low levels of social relationships.

Figure 1: Family, friendships and social life at age 50: predicted probabilities expressed as percentages from full model with covariates, by disability status. Significant differences by disability status only (N = 12,762).



Source: National Child Development Study (NCDS).
Notes:
All scores significantly different from teenagers with no disability at $p < .05$.
Full model includes as covariates: child sex, family background and respondent's highest qualification.

Next Steps: social relationships at age 25

Next Steps respondents were interviewed as young adults in 2015 when aged about 25. Table 3 shows that this later-born cohort had poorer social outcomes even in early adulthood, if they had been identified as disabled at school. Around a quarter (25.7%) of non-disabled men had yet to leave the parental home by age 25, but this was 40.7% for those disabled in childhood. Although the pattern was the same for women, differences were not as pronounced (17.9% compared to 25.8%); but 50.2% men and 36.4% women with severe disability were still at home. Romantic relationships were also more limited for disabled young people: among men, 50.7% with a disability and 59.4% with a severe disability in adolescence were neither cohabiting nor in a romantic relationship compared to 38.1% of those without disability; while among women the figures were 45.2% and 68.3% compared to 29.7%. Although these 25-year-olds are at a very different stage in life from the NCDS cohort, they show comparable tendencies to live at home for longer and miss out on intimate relationships. Those disabled in adolescence were also around half as likely as their non-disabled peers ever to have had sex: 16.0%/22.5% compared to 5.6% for men and 12.6%/26.5% compared to 5.9% for women. Despite this, disabled men and women were more likely to have become a parent by age 25.

Table 3: Social relationships at age 25, by childhood disability status, % in category (N = 7,499)

	Men (N = 3,327)			**Women (N = 4,172)**		
	No disability (81.9%)	**Disability (18.1%)**	**Severe disability (7.7%)**	**No disability (90.3%)**	**Disability (9.7%)**	**Severe disability (2.8%)**
	% in category	**% in category**	**% in category**	**% in category**	**% in category**	**% in category**
Family and friends						
Rarely meet up with friends	4.0	10.4*	10.1*	5.1	12.7*	21.5*
Never had sex	5.6	16.0*	22.5*	5.9	12.6*	26.5*
Cohabiting	36.4	30.3^	19.2*	46.2	39.3^	25.1*
In a relationship	25.5	19.1*	21.4*	24.1	15.5*	6.6*
Not in a relationship	38.1	50.7*	59.4*	29.7	45.2*	68.3*
Has children	18.0	26.6*	21.8	31.6	41.5*	22.4
Never left parental home	25.7	40.7*	50.2*	17.9	25.8*	36.4*
Social activities						
Rarely or never engage in physical activity	18.5	33.8*	36.0*	28.2	39.2*	43.7*
Rarely or never go to the cinema, concerts, theatre	49.1	63.6*	71.0*	56.5	69.4*	72.4*
Rarely or never go out for a drink	32.6	48.7*	56.4*	44.5	57.8*	60.5*
Rarely or never go out for a meal	21.3	35.4*	45.5*	21.4	33.0*	37.0*
Bullying and hate crime						
Have been called names or verbally abused	18.5	16.5	20.3	15.8	19.4	30.4*
Have been bullied or gossiped about or ignored	15.5	12.9	15.6	18.8	26.7*	36.7*
Subjective measures						
People are not willing to listen to problems	10.2	18.6*	22.2*	9.0	19.8*	27.6*
Little trust in others	18.5	19.8	20.1	18.9	29.1*	28.8
N (unweighted)	*2,924*	*403*	*165*	*3,898*	*274*	*73*

Source: Next Steps.

Notes:

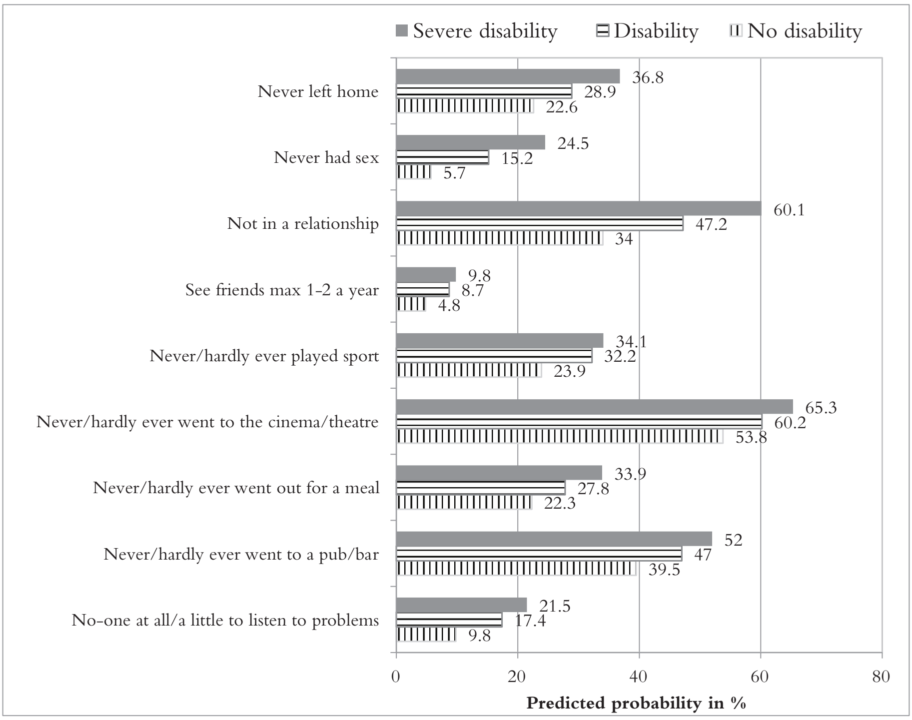
All percentages are based on weighted distributions.

* indicates significantly different from children with no disability at $p < .05$.

^ $p < .1$.

All measures represent negative or low levels of social relationships. Full details on coding are provided in 'Data and methods' section. Severe disability is a subset of disability.

Figure 2: Social relationships at age 25: predicted probabilities expressed as percentages from full model with covariates, by disability status. Significant differences by disability status only (N = 7,499)



Source: Next Steps.

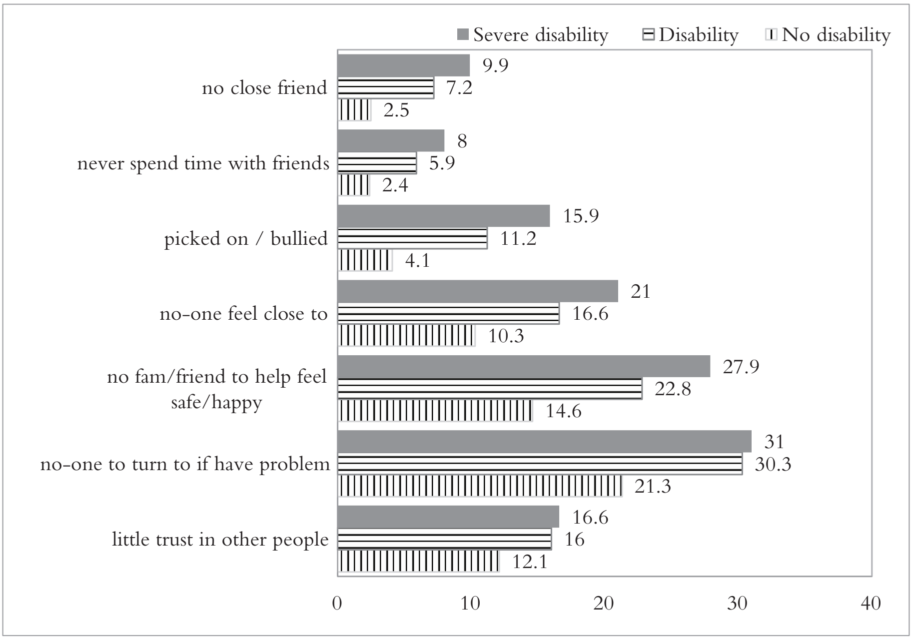
Notes:

Full model includes as covariates: child sex, family background and respondent's highest qualification.
Among those with a severe disability, all scores significantly different from teenagers with no disability at $p < .05$.

Only 4% of non-disabled men and 5.1% of non-disabled women rarely met friends; but the rates were over 10% for disabled men and women and severely disabled men, rising to 21.5% for severely disabled women. Like their older counterparts in the NCDS, 25-year-olds who were disabled in adolescence also had a much more restricted social life, being much less likely to engage in physical activity, go to the cinema or theatre, or go out for a meal or drink. Once again, differences were greater for those with a severe disability. There were, however, no differences by disability status among men across bullying measures; though severely disabled women were around twice as likely to have experienced verbal abuse and bullying as non-disabled women (30.4% compared to 15.8% for verbal abuse and 36.7% compared to 18.8% for bullying).

Turning to subjective measures, there was some indication that childhood disability was associated with loneliness in early adulthood, with double the proportions feeling they had no one to listen to their problems (18.6%/22.2% compared to 10.2% for men and 19.8%/27.6% compared to 9% for women), results very similar to the equivalent measure for 50-year-olds in the NCDS. It is striking that while the patterns

Figure 3: Social relationships at age 14: predicted probabilities expressed as percentages from full model with covariates, by disability status. Significant differences by disability status only (N = 11,534).



Source: Millennium Cohort Study (MCS).

Notes:

All scores significantly different from teenagers with no disability at $p < .05$.

Full model includes as covariates: child sex, family background and respondent's cognitive ability.

are starker for the measure of severe disability, the broader disability category is also strongly and significantly associated with most of these measures.

Even in the adjusted models, many of these gaps in social relationships persisted. This indicates an independent effect of disability over and above the influence of more disadvantaged class backgrounds and the consequences of poorer educational outcomes. Figure 2 shows that this was particularly the case for family-related transitions.

MCS: social relationships at age 14

Table 4 shows the social situation of contemporary teenagers, at the time they are identified as disabled in school. Consistent with earlier research (Hodges et al, 1999; Crawford and Manassis, 2011; Chatzitheochari et al, 2016), but in contrast with some other studies (Avramadis, 2013), we see lower social integration in school for disabled children. In 2015, 12.2% teenage boys with a disability said they did not have a close friend, rising to 17.3% with a severe disability. This compared with only 3.5% of non-disabled boys lacking a close friend. In addition, three times as many disabled teenagers reported that they 'never' spent time with close friends outside school (9.0%/12.7% compared to 3.0% for boys and 9.6%/17.6% compared to 2.6% for girls). Disabled teenagers were significantly more likely to have been picked on

Table 4: Social relationships at age 14, by disability status, % in category (N = 11,534)

	Boys (N = 5,790)			**Girls (N = 5,744)**		
	No disability (85.5%)	**Disability (14.5%)**	**Severe disability (7.9%)**	**No disability (93.0%)**	**Disability (7.0%)**	**Severe disability (3.1%)**
	% in category	**% in category**	**% in category**	**% in category**	**% in category**	**% in category**
Friends and trust						
No close friend	3.5	12.2*	17.3*	2.0	5.7*	7.9
Rarely spend time with close friends outside school	9.2	20.9*	25.2*	8.4	20.1*	32.4*
Never spend time with close friends outside school	3.0	9.0*	12.7*	2.6	9.6*	17.6*
Bullying and hate crime						
Picked on most days	3.9	12.4*	16.1*	4.4	10.8*	19.2*
Insulted, threatened or shouted at in last 12 months	42.3	46.7	53.1*	45.0	46.8	55.7
Subject to physical violence in last 12 months	30.1	33.9	34.2	15.7	21.1	28.0*
Hit with a weapon in last 12 months	4.3	7.3	8.9	2.4	4.7	10.8*
Subjective measures						
Lack family/friend to help feel safe or happy	13.7	24.2*	31.3*	15.7	21.2	20.0
Lack someone to turn to	23.9	35.9*	38.1*	18.8	26.6^	25.5
Lack someone feel close to	8.5	19.4*	24.0*	12.5	12.7	16.2
Little trust in others	8.7	12.1^	12.7	17.0	22.9	24.6
N (unweighted)	*5,037*	*753*	*390*	*5,364*	*380*	*169*

Source: Millennium Cohort Study (MCS).

Notes:

* indicates significantly different from children with no disability at $p < .05$.

^ $p < .1$.

All measures represent negative or low levels of social relationships, full details on coding is provided in 'Data and methods' section.

Severe disability is a subset of disability.

All percentages are based on weighted distributions.

by other children 'most days' (12.4%/16.1% compared to 3.9% among boys and 10.8%/19.2% compared to 4.4% among girls).

When looking at subjective measures, significantly greater risks of these indicators of loneliness were found for disabled boys, but not for disabled girls, perhaps reflecting the fact that this is an age when more teenage girls in general are at risk of loneliness. Disabled and severely disabled boys had greater rates of not feeling safe (24.2%/31.3% compared to 13.7%), lacking someone they felt close to (19.4%/24.0% compared to 8.5%), and lacking someone to turn to with problems (35.9%/38.1% compared to 23.9%). Comparison with the NCDS and Next Steps suggests that adulthood brings greater risks of loneliness for disabled and non-disabled alike; but the findings here suggest that the greater risks for disabled people may nevertheless start young.

Controlling for cognitive ability and parental social class substantially attenuated a number of these differences between disabled and non-disabled teenagers. This suggests that some of these differences in social relationships between disabled and non-disabled children are attributable to social class differences in social exclusion and those associated with lower cognitive ability and educational performance (compare Pijl and Frostad, 2010). Nevertheless, significant gaps in risks of social isolation and in bullying and self-harm remained, particularly for those severely disabled, as shown in Figure 3. Consistent with Table 4, interaction models showed that it was disabled boys rather than girls who were more likely to lack a close friend, someone they felt close to and someone to make them feel safe.

Discussion

Our findings reveal the extent of social isolation and risks of loneliness among one of the most vulnerable groups in our society, disabled people. We have shown some stark differences in social relationships among those identified as disabled in childhood. We find these differences for younger as well as older cohorts; and many of the differences cannot be accounted for by social origins or educational attainment. From these findings, we conclude that disability is linked across the life course to poorer social outcomes. Despite the relatively greater attention paid to disabled people's economic outcomes (for example, Burchardt, 2005; Demos, 2006; Longhi et al, 2012; Gardiner and Gaffney, 2016; Jones et al, 2018; Powell, 2020), the social consequences of disability cannot be solely attributed to differences in socio-economic position or the later onset of disability (Lund et al, 2010). Instead they start early and persist.

The particularly poor social outcomes of disabled adults in later middle age invite attention to how social support might be better sustained across the life course. However, the fact that young disabled people also face deficiencies in their social relationships suggests that it is not only the greater vulnerability linked to ageing that drives the association between disability and social isolation. Instead, our findings suggest consistent processes linked to experience of marginality early in life. In addition, the association between childhood disability and social relationships cannot be relegated to issues in an earlier period, arguably less attuned to the needs of those with disabilities (Warnock Report, 1978). Despite years of successive governments agreeing that those with disabilities and additional needs deserve a better, fairer deal out of life (Children and Families Act, 2014; EHRC, 2017), today's disabled teenagers still experience greater social isolation than their non-disabled peers. Early intervention may be necessary to set today's disabled children on a more positive pathway in terms of maintenance of social support and its positive consequences (Berkman et al, 2000).

Notable among our findings was that disadvantage was observed to a greater or lesser extent across all domains of social experience: both intimate and extended (Berkman, 2000), and for both objective networks and subjective social support (De Jong Gierveld et al, 2006). This suggests that disabled people face enhanced risks of both social isolation and loneliness across their lives. Relatively high chances of lacking a close friend or, among adults, an intimate relationship – a crucial way that social support can mitigate environmental or health insults – was a consistent feature of the patterns across all three generations. The extended social networks of adults were also more limited. Across all three cohorts, disabled respondents expressed deficiencies in having someone to turn to, though among the teenagers, the effect was driven by disabled boys. While only a single indicator, this measure of lower support suggests risks of loneliness.

Some differences in the experience of disabled youth were linked to their poorer socio-economic circumstances, in terms of both parental social class and educational attainment. However, these factors could not account for many of the observed gaps. Indeed, for the older cohort, estimates scarcely changed when adjusting for these confounders. For the younger cohorts, effects were somewhat attenuated when parental social class and educational attainment were controlled, indicating not only the close links between economic marginality and child disability, but also the ways in which education can be protective for social relationships, particularly as educational participation and attainment expands.

Our study has its limitations. Our measure of disability, embedded in the social context, and relating to being disabled in an educational setting, is, by the same token, temporally specific. As an overarching measure of disability, it is also not possible to draw out the mechanisms linking specific disabilities to social isolation. Nevertheless, it is consistent with research that has examined the social consequences for young people of being identified with disability or special needs. It is also consistent with policy frameworks that regard special educational needs and disability as overlapping concepts (for example, DfE and DH, 2015). Moreover, it is as a social category that we would expect disability to be associated with social outcomes, which is the rationale behind our approach. There are also limits to our measures of loneliness. While we are interested in both social isolation and loneliness as distinct aspects of social relationships, for loneliness, we are largely reliant on a single indicator. Our conclusions about risks of loneliness thus remain tentative; though the consistent findings across the equivalent measure in the three studies suggests the potential utility of this indicator. Our multiple, age-appropriate indicators of social isolation are, conversely, not fully comparable across the different cohorts, though we can draw on measures that tap into common key concepts across the two adult studies in particular. Given that we are measuring outcomes at different ages for the younger and older cohorts, we cannot distinguish age, period and cohort effects. Our results are indicative that later life social outcomes are going to be restricted for the younger cohorts, despite the different context in which they have grown up and the extension of school-based measures of disability. But we will only fully be able to ascertain this as they age. Finally, there is substantial attrition in Next Steps between the time at which disability is evaluated and social relationships are measured. As discussed, we found no evidence of differential non-contact / non-response by disability status. Nevertheless, if respondents at age 25 differ in unmeasured ways from those lost to follow up, this would bias our results if these unmeasured characteristics were associated with both disability status in adolescent and adult social relationships.

Despite these limitations, we have drawn attention to the ways in which crucial aspects of fully lived lives are more limited for those identified as disabled in childhood. These deficiencies in social relationships come with costs for both individuals and society, given the association between social isolation and loneliness with greater morbidity and mortality (James, 2008; Steptoe et al, 2013; Valtorta et al, 2016). By looking at identification of a disability in the teenage years in different generations, we can see how additional needs in childhood impact social relationships and aspects of isolation over the life course. In measuring disability in childhood, our results are not subject to reverse causation or factors associated with the onset of disability in later life. Our findings thus invite greater attention to and understanding of the direct mechanisms linking disability to social isolation and evaluation of its consequences.

Our research is timely given that the issues of social isolation and loneliness have been receiving more attention in the UK political agenda (Jo Cox Commission, 2017; DDCMS, 2018). Yet, recent, well-documented cuts to social care budgets and consequently in services for disabled people will only tend to increase levels of social isolation among older people; while reduced youth facilities are impacting younger people. Social and activity groups based around common interests are key for enabling those with disabilities to build 'real' friendships (SENSE, 2015); and such clubs and activities are, as we have shown, likely to support not only the current but also the future well-being of disabled youth. Understanding further both the links between being disabled in school and lifelong social relationships and adopting interventions to address those links is crucial if expressed policy commitment to equalising life chances for disabled people is to be achieved.

Conflict of interest

The authors declare that there is no conflict of interest.

References

Aiden, H. and McCarthy, A. (2014) *Current Attitudes Towards Disabled People*, London: Scope.

Allison, P.D. (2001) *Missing Data: Quantitative Applications in the Social Sciences*, Vol 136, Thousand Oaks, CA: Sage.

Altman, B.M. (2014) Definitions, concepts, and measures of disability, *Annals of Epidemiology*, 24(1): 2–7. doi: 10.1016/j.annepidem.2013.05.018

Anderson, P. and Kitchin, R. (2000) Disability, space and sexuality: access to family planning services, *Social Science & Medicine*, 51(8): 1163–73.

Avramadis, E. (2013) Self-concept, social position and social participation of pupils with SEN in mainstream primary schools, *Research Papers in Education*, 28(4): 421–42. doi: 10.1080/02671522.2012.673006

Barnes, C. and Mercer, G. (2005) *The Social Model of Disability: Europe and the Majority World*, Leeds: Disability Press.

Beaumont, J. (2013) Measuring national well-being – older people and loneliness, London: Office for National Statistics, Available at: https://www.bl.uk/collection-items/measuring-national-wellbeing-older-people-and-loneliness-2013

Beresford, B. and Rhodes, D. (2008) *Housing and Disabled Children*, York: Joseph Rowntree Foundation, Available at: https://www.jrf.org.uk/report/housing-and-disabled-children

Berkman, L.F. (2000) Social support, social networks, social cohesion and health, *Social Work in Health Care*, 31(2): 3–14. doi: 10.1300/J010v31n02_02

Berkman, L.F. and Syme, S.L. (1979) Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County residents, *American Journal of Epidemiology*, 109(2): 186–204. doi: 10.1093/oxfordjournals.aje.a112674

Berkman, L.F., Glass, T., Brissette, I. and Seeman, T.E. (2000) From social integration to health: Durkheim in the new millennium, *Social Science & Medicine*, 51(6): 843–57.

BIS (Department for Business, Innovation and Skills) (2009) Digital Britain: Final report, Cm 7650, London: TSO.

Breen, R., Karlson, K.B. and Holm, A. (2018) Interpreting and understanding logits, probits, and other nonlinear probability models, *Annual Review of Sociology*, 44(1): 39–54. doi: 10.1146/annurev-soc-073117-041429

Burchardt, T. (2005) *The Education and Employment of Disabled Young People: Frustrated Ambition*, Bristol: Policy Press.

Burholt, V., Windle, G. and Morgan, D.J. (2017) A social model of loneliness: The roles of disability, social resources, and cognitive impairment, *The Gerontologist*, 57(6): 1020–30.

Cacioppo, J.T. and Patrick, W. (2008) *Loneliness: Human Nature and the Need for Social Connection*, New York: W.W. Norton.

Calderwood, L., Smith, K., Gilbert, E., Rainsberry, M., Knibbs, S. and Burston, K. (2015) Securing participation and getting accurate answers from teenage children in surveys: Lessons from the UK Millennium Cohort Study, *Social Research Practice*, 1(1): 27–32.

Chatzitheochari, S. and Platt, L. (2019) Disability differentials in educational attainment in England: primary and secondary effects, *British Journal of Sociology*, 70(2): 502–25. doi: 10.1111/1468-4446.12372

Chatzitheochari, S., Parsons, S. and Platt, L. (2016) Doubly disadvantaged? Bullying experiences among disabled children and young people in England, *Sociology*, 50(4): 695–713. doi: 10.1177/0038038515574813

Children and Families Act (2014) Chapter 6, part 3: Children and young people in England with special educational needs or disabilities, Available at: https://www.legislation.gov.uk/ukpga/2014/6/pdfs/ukpga_20140006_en.pdf

Clarke, H. and McKay, S. (2008) *Exploring Disability, Family Formation and Break-up: Reviewing the Evidence*, Department for Work and Pensions Research Report No. 514, London: DWP.

Cohen, S., Doyle, W.J., Skoner, D.P., Rabin, B.S. and Gwaltney, J.M. Jr (1997) Social ties and susceptibility to the common cold, *Journal of the American Medical Association*, 277(24): 1940–4. doi: 10.1001/jama.1997.03540480040036

Connelly, R. (2013) *Millennium Cohort Study Data Note 2013/1: Interpreting Test Scores*, London: Centre for Longitudinal Studies.

Cornwell, E.Y. and Waite, L.J. (2009) Measuring social isolation among older adults using multiple indicators from the NSHAP Study, *Journals of Gerontology Series B*, 64B(Suppl. 1): i38–i46.

Cotterell, N., Buffel, T. and Phillipson, C. (2018) Preventing social isolation in older people, *Maturitas*, 113: 80–4. doi: 10.1016/j.maturitas.2018.04.014

Crawford, A. and Manassis, K. (2011) Anxiety, social skills, friendship quality, and peer victimization: an integrated model, *Journal of Anxiety Disorders*, 25(7): 924–31. doi: 10.1016/j.janxdis.2011.05.005

DDCMS (Department for Digital, Culture, Media and Sport) (2018) *A Connected Society: A Strategy for Tackling Loneliness – Laying the Foundations for Change*, London: DDCMS.

De Jong Gierveld, J. and Van Tilburg, T.G. (2006) A 6-item scale for overall, emotional, and social loneliness: confirmatory tests on survey data, *Research on Aging*, 28(5): 582–98. doi: 10.1177/0164027506289723

De Jong Gierveld, J. and Van Tilburg, T. (2010) The De Jong Gierveld short scales for emotional and social loneliness: tested on data from 7 countries in the UN generations and gender surveys, *European Journal of Ageing*, 7(2): 121–30. doi: 10.1007/s10433-010-0144-6

De Jong Gierveld, J., Van Tilburg, T. and Dykstra, P.A. (2006) Loneliness and social isolation, in A.L. Vangelisti and D. Perlman (eds), *Cambridge Handbook of Personal Relationships*, Cambridge: Cambridge University Press: 485–500 .

Demos (2004) *Disablism: How to Tackle the Last Prejudice*, London: Demos.

Demos (2006) *Disablist Britain: Barriers to Independent Living for Disabled People in 2006*, London: Demos.

DfE and DH (Department for Education and Department of Health) (2015) Special educational needs and disability code of practice: 0 to 25 years – statutory guidance for organisations which work with and support children and young people who have special educational needs or disabilities, Available at: https://www.gov.uk/government/publications/send-code-of-practice-0-to-25

DiTommaso, E. and Spinner, B. (1993) The development and initial validation of the social and emotional loneliness scale for adults (SELSA), *Personality and Individual Differences*, 14(1): 127–34. doi: 10.1016/0191-8869(93)90182-3

Dixon, S., Smith, C. and Touchet, A. (2018) *The Disability Perception Gap: Policy Report*, London: Scope.

Durcan, D. and Bell, R. (2015) *Local Action On Health Inequalities: Reducing Social Isolation Across the Lifecourse*, London: Public Health England and UCL Institute of Health Equality.

Dykstra, P.A. (2009) Older adult loneliness: myths and realities, *European Journal of Ageing*, 6(2): 91–100. doi: 10.1007/s10433-009-0110-3

EHRC (Equality and Human Rights Commission) (2017) Being disabled in Britain: A journey less equal, London: EHRC, Available at: https://www.equalityhumanrights.com/en/publication-download/being-disabled-britain-journey-less-equal

Elliott, C. (1996) *BAS II Administration and Scoring Manual*, London: Nelson.

Elliott, C., Smith, P. and McCulloch, K. (1997) *British Ability Scales*, 2nd edn, London: Nelson.

Emerson, E., Blacher, J., Einfeld, S., Hatton, C., Robertson, J. and Stancliffe, R.J. (2014) Environmental risk factors associated with the persistence of conduct difficulties in children with intellectual disabilities and autistic spectrum disorders, *Research in Developmental Disabilities*, 35(12): 3508–17. doi: 10.1016/j.ridd.2014.08.039

Eng, P.M., Rimm, E.B., Fitzmaurice, G. and Kawachi, I. (2002) Social ties and change in social ties in relation to subsequent total and cause-specific mortality and coronary heart disease incidence in men, *American Journal of Epidemiology*, 155(8): 700–9. doi: 10.1093/aje/155.8.700

Erickson, G.A. and Macmillan, R. (2018) Disability and the transition to early adulthood: a life course contingency perspective, *Longitudinal and Life Course Studies*, 9(2): 188–211. doi: 10.14301/llcs.v9i2.335

Gardiner, L. and Gaffney, D. (2016) *Retention Deficit: A New Approach to Boosting Employment for People With Health Problems and Disabilities*, London: Resolution Foundation, Available at: https://www.resolutionfoundation.org/publications/retention-deficit/

Greenfield, T.K., Rehm, J. and Rogers, J.D. (2002) Effects of depression and social integration on the relationship between alcohol consumption and all-cause mortality, *Addiction*, 97(1): 29–38. doi: 10.1046/j.1360-0443.2002.00065.x

Griffiths, H. (2017) Social isolation and loneliness in the UK, with a focus on the use of technology to tackle these conditions, Available at: https://iotuk.org.uk/wp-content/uploads/2017/04/Social-Isolation-and-Loneliness-Landscape-UK.pdf

Harris, J. and Lord, C. (2016) Mental health of children with vision impairment at 11 years of age, *Developmental Medicine and Child Neurology*, 58(7): 774–9. doi: 10.1111/dmcn.13032

Heinrich, L.M. and Gullone, E. (2006) The clinical significance of loneliness: A literature review, *Clinical Psychology Review*, 26(6): 695–718. doi: 10.1016/j.cpr.2006.04.002

Hodges, E.V., Boivin, M., Vitaro, F. and Bukowski, W.M. (1999) The power of friendship: Protection against an escalating cycle of peer victimization, *Developmental Psychology*, 35(1): 94–101. doi: 10.1037/0012-1649.35.1.94

Holt-Lunstad, J., Smith, T.B. and Layton, J.B. (2010) Social relationships and mortality risk: A meta-analytic review, *PLOS Med*, 7(7): e1000316, Available at: https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000316 doi: 10.1371/journal.pmed.1000316

Holt-Lunstad, J., Smith, T.B., Baker, M., Harris, T. and Stephenson, D. (2015) Loneliness and social isolation as risk factors for mortality: A meta-analytic review, *Perspectives on Psychological Science*, 10(2): 227–37. doi: 10.1177/1745691614568352

Hughes, M.E., Waite, L.J., Hawkley, L.C. and Cacioppo, J.T. (2004) A short scale for measuring loneliness in large surveys: Results from two population-based studies, *Research on Aging*, 26(6): 655–72. doi: 10.1177/0164027504268574

Hutchinson, J. (2017) *How Many Children Have SEND?*, London: Education Policy Institute.

IPPR (2007) Disability 2020: Opportunities for the full and equal citizenship of disabled people in 2020, Available at: https://www.ippr.org/publications/disability-2020opportunities-for-the-full-and-equal-citizenship-of-disabled-people-in-britain-in-2020

James, O. (2008) *The Selfish Capitalist: The Origins Of Affluenza*, London: Vermilion.

Janus, A.L. (2009) Disability and transition to adulthood, *Social Forces*, 88(1): 99–120. doi: 10.1353/sof.0.0248

Jenkins, S.P. and Rigg, J.A. (2004) Disability and disadvantage: Selection, onset, and duration effects, *Journal of Social Policy*, 33(3): 479–501. doi: 10.1017/S0047279404007780

Jo Cox Commission on Loneliness (2017) Combating loneliness one conversation at a time: A call to action, Available at: https://www.jocoxfoundation.org/loneliness_commission

Jones, M.K. (2008) Disability and the labour market: A review of the empirical evidence, *Journal of Economic Studies*, 35(5): 405–24. doi: 10.1108/01443580810903554

Jones, M.K., Davies, R. and Drinkwater, S. (2018) The dynamics of disability and work in in Britain, *The Manchester School*, 86(3): 279–307. doi: 10.1111/manc.12177

Kroenke, C.H., Kubzansky, L.D., Schernhammer, E.S., Holmes, M.D. and Kawachi, I. (2006) Social networks, social support, and survival after breast cancer diagnosis, *Journal of Clinical Oncology*, 24(7): 1105–11. doi: 10.1200/JCO.2005.04.2846

Laxton, C. and Goldsworthy, A. (2008) Up close and personal: A report into disabled and non-disabled people's attitudes and experiences of relationships in the UK, London: Leonard Cheshire Disability.

Little, R.J.A. and Rubin, D.B. (2002) *Statistical Analysis With Missing Data*, 2nd edn, Hoboken, NJ: Wiley.

Longhi, S., Nicoletti, C. and Platt, L. (2012) Interpreting wage gaps of disabled men: The roles of productivity and of discrimination, *Southern Economic Journal*, 78(3): 931–53. doi: 10.4284/0038-4038-78.3.931

Loprest, P. and Maag, E. (2007) The relationship between early disability onset and education and employment, *Journal of Vocational Rehabilitation*, 26(1): 49–62.

Lund, R. Nilsson, C.J. and Avlund, K. (2010) Can the higher risk of disability onset among older people who live alone be alleviated by strong social relations? A longitudinal study of non-disabled men and women, *Age and Ageing*, 39(3): 319–26. doi: 10.1093/ageing/afq020

Marmot, M. (2010) *Fair Society, Healthy Lives: Strategic Review of Health Inequalities – the Marmot Review*, n.p.: The Marmot Review.

Maroto, M., Pettinicchio, D. and Patterson, A.C. (2019) Hierarchies of categorical disadvantage: Economic insecurity at the intersection of disability, gender, and race, *Gender & Society*, 33(1): 64–93. doi: 10.1177/0891243218794648

Mood, C. (2010) Logistic regression: Why we cannot do what we think we can do, and what we can do about it, *European Sociological Review*, 26(1): 67–82. doi: 10.1093/esr/jcp006

Nicolaisen, M. and Thorsen, K. (2014) Who are lonely? Loneliness in different age groups (18 to 81 years old), using two measures of loneliness, *The International Journal of Aging and Human Development*, 78(3): 229–57. doi: 10.2190/AG.78.3.b

Norwich, B. (2019) From the Warnock Report (1978) to an education framework commission: A novel contemporary approach to educational policy making for pupils with special educational needs/disabilities, *Frontiers in Education*, 4, Available at: https://doi.org/10.3389/feduc.2019.00072 doi: 10.3389/feduc.2019.00072

ONS (Office for National Statistics) (2015) Life opportunities survey, wave three, final report, October 2012 to September 2014, Available at: http://www.ons.gov.uk/ons/rel/los/life-opportunities-survey/wave-three--final-report--october-2012-to-september-2014/index.html

ONS (Office for National Statistics) (2018a) Loneliness: what characteristics and circumstances are associated with feeling lonely? Analysis of characteristics and circumstances associated with loneliness in England using the Community Life Survey, 2016 to 2017, Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/lonelinesswhatcharacteristicsandcircumstancesareassociatedwithfeelinglonely/2018-04-10

ONS (Office for National Statistics) (2018b) Internet users, UK: 2018 – internet use in the UK annual estimates by age, sex, disability and geographical location, Available at: https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2018

ONS (Office for National Statistics) (2019) Measuring national well-being in the UK: International comparisons, 2019, Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/measuringnationalwellbeing/internationalcomparisons2019

Pantell, M. Rehkopf, D., Jutte, D., Syme, S.L., Balmes, J. and Adler, N. (2012) Social isolation: A predictor of mortality comparable to traditional clinical risk factors, *American Journal of Public Health*, 103(11): 2056–62. doi: 10.2105/AJPH.2013.301261

Parliament Select Committee (2018) Online abuse and the experience of disabled people: Draft recommendations for consultation, Available at: https://www.parliament.uk/business/committees/committees-a-z/commons-select/petitions-committee/inquiries/parliament-2017/online-abuse-17-19/

Parnell, R. and Bush, M. (2009) *Unequal Citizenship: the Personal is Political! Disablism Audit Series*, London: Scope.

Parsons, S. (2012) *National Child Development Study: Warnock Study of Handicapped School Leavers (1976), A Guide to the Data*, London: Centre for Longitudinal Studies, Available at: https://cls.ucl.ac.uk/wp-content/uploads/2017/07/ncds_warnock.pdf

Parsons, S. and Platt, L. (2013) *Millennium Cohort Study: Disability Among Young Children: Prevalence, Heterogeneity and Socio-Economic Disadvantage*, Centre for Longitudinal Studies Working Paper 2013/11, London: CLS.

Parsons, S. and Platt, L. (2017) The early academic progress of children with special educational needs, *British Educational Research Journal*, 43(3): 466–85. doi: 10.1002/berj.3276

Perissinotto, C.M., Stijacic Cenzer, I. and Covinsky, K.E. (2012) Loneliness in older persons: A predictor of functional decline and death, *Archives of Internal Medicine*, 172(14): 1078–83. doi: 10.1001/archinternmed.2012.1993

Pijl, S.J. and Frostad, P. (2010) Peer acceptance and self-concept of students with disabilities in regular education, *European Journal of Special Needs Education*, 25(1): 93–105. doi: 10.1080/08856250903450947

Pitzele, S.K. (1995) Chronic illness, disability and sexuality in people older than fifty, *Sexuality and Disability*, 13(4): 309–25. doi: 10.1007/BF02592494

Plewis, I. (ed.) (2007) *Millennium Cohort Study First Survey: Technical Report On Sampling, 4th edn*, London: Centre for Longitudinal Studies.

Powell, A. (2020) *People With Disabilities in Employment*, House of Commons Library, Briefing Paper No. 7540, London: House of Commons Library.

Powell, J.J.W. (2003) Constructing disability and social inequality early in the life-course: The case of special education in Germany and the United States, *Disability Studies Quarterly*, 23(2): 57–75. doi: 10.18061/dsq.v23i2.414

Powell, J.J.W. (2006) Special education and the risk of becoming less educated, *European Societies*, 8(4): 577–99. doi: 10.1080/14616690601002673

Power, C. and Elliott, J. (2006) Cohort profile: 1958 British birth cohort (National Child Development Study), *International Journal of Epidemiology*, 35(1): 34–41. doi: 10.1093/ije/dyi183

Priestley, M. (ed.) (2001) *Disability and the Life-Course: Global Perspectives*, Cambridge: Polity Press.

Pyer, M. and Bush, M. (2009) *Disabled Families in Flux: Removing Barriers to Family Life*, London: Scope.

Qualter, P., Brown, S.L., Rotenberg, K.J., Vanhalst, J., Harris, R.A., Goossens, L., Bangee, M. and Munn, P. (2013) Trajectories of loneliness during childhood and adolescence: Predictors and health outcomes, *Journal of Adolescence*, 36(6): 1283–93. doi: 10.1016/j.adolescence.2013.01.005

Rose, D. and Pevalin, D.J. (eds) (2003) *A Researcher's Guide to the National Statistics Socioeconomic Classification*, London: Sage.

Rose, D., Pevalin, D.J. and O'Reilly, K. (2005) *The National Statistics Socio-Economic Classification: Origins, Development and Use*, Basingstoke: Palgrave Macmillan.

Ruijs, N.M. and Peetsma, T.D. (2009) Effects of inclusion on students with and without special educational needs reviewed, *Educational Research Review*, 4(2): 67–79. doi: 10.1016/j.edurev.2009.02.002

Russell, D., Peplau, L.A. and Ferguson, M.L. (1978) Developing a measure of loneliness, *Journal of Personality Assessment*, 42(3): 290–4. doi: 10.1207/s15327752jpa4203_11

Schafer, J.L. (1997) *Analysis of Incomplete Multivariate Data*, London: Chapman and Hall.

SENSE (2015) *A Right to Friendship? Challenging the Barriers to Friendship for People With Disabilities*, London: SENSE.

Singleton, P. (2012) Insult to injury disability, earnings, and divorce, *Journal of Human Resources*, 47(4): 972–90. doi: 10.1353/jhr.2012.0035

Steptoe, A., Shankar, A., Demakakos, P. and Wardle, J. (2013) Social isolation, loneliness, and all-cause mortality in older men and women, *PNAS*, 110(15): 5797–801. doi: 10.1073/pnas.1219686110

Tomlinson, S. (2017) *A Sociology of Special and Inclusive Education: Exploring the Manufacture of Inability*, Abingdon: Routledge.

UNICEF (2013) *The State of the World's Children 2013: Children With Disabilities*, New York: UNICEF.

University College London, Institute of Education, Centre for Longitudinal Studies (2018) Next steps: Sweeps 1–8, 2004–2016 [data collection], 14th edn, UK Data Service, SN: 5545, Available at: http://doi.org/10.5255/UKDA-SN-5545-6

University of London, Institute of Education, Centre for Longitudinal Studies (2012a) National child development study: Sweep 8, 2008–2009 [data collection], 3rd edn, UK Data Service, SN: 6137, Available at: http://doi.org/10.5255/UKDA-SN-6137-2

University of London, Institute of Education, Centre for Longitudinal Studies (2014) National child development study: childhood data, sweeps 0–3, 1958–1974 [data collection], 3rd edn, National Birthday Trust Fund, National Children's Bureau [original data producers], SN: 5565, Available at: http://doi.org/10.5255/UKDA-SN-5565-2

University of London, Institute of Education, Centre for Longitudinal Studies (2017a) Millennium Cohort Study: First survey, 2001–2003 [data collection], 12th edn, UK Data Service, SN: 4683, Available at: http://doi.org/10.5255/UKDA-SN-4683-4

University of London, Institute of Education, Centre for Longitudinal Studies (2017b) Millennium Cohort Study: Third survey, 2006 [data collection], 7th edn, UK Data Service, SN: 5795, Available at: http://doi.org/10.5255/UKDA-SN-5795-4

University of London, Institute of Education, Centre for Longitudinal Studies (2017c) Millennium Cohort Study: Fifth survey, 2012 [data collection], 4th edn, UK Data Service, SN: 7464, Available at: http://doi.org/10.5255/UKDA-SN-7464-4

University of London, Institute of Education, Centre for Longitudinal Studies (2019) Millennium Cohort Study: Sixth survey, 2015 [data collection], 4th edn, UK Data Service, SN: 8156, Available at: http://doi.org/10.5255/UKDA-SN-8156-4

University of London, Institute of Education, Centre for Longitudinal Studies, National Birthday Trust Fund and National Children's Bureau (2012b) Warnock Study of Handicapped School Leavers, 1976 [data collection], 2nd edn, UK Data Service, SN: 2024, Available at: http://doi.org/10.5255/UKDA-SN-2024-2

Valtorta, N.K., Kanaan, M., Gilbody, S., Ronzi, S. and Hanratty, B. (2016) Loneliness and social isolation as risk factors for coronary heart disease and stroke: Systematic review and meta-analysis of longitudinal observational studies, *Heart*, 102(13): 1009–16. doi: 10.1136/heartjnl-2015-308790

Walker, A. (1982) *Unqualified and Underemployed – Handicapped Young People and the Labour Market*, London: Macmillan.

Warnock Report (1978) *Special Educational Needs: Report of the Committee of Enquiry into the Education of Handicapped Children and Young People*, Cmnd. 7212, London: Her Majesty's Stationery Office.

Wilson, L.M. (2003) *Young Disabled People: A Survey of the Views and Experiences of Young Disabled People in Great Britain*, London: Disability Rights Commission.

Wilson, R.S., Krueger, K.R., Arnold, S.E., Schneider, J.A., Kelly, J.F., Barnes, L.L. Tang, Y. and Bennett, D.A. (2007) Loneliness and risk of Alzheimer disease, *Archives of General Psychiatry*, 64(2): 234–40. doi: 10.1001/archpsyc.64.2.234

Table A1: original variable answer categories and recoded values

Original variable and answer categories	Recoded values
Friends	
NCDS	
In the past two weeks, how often have you gone out to visit friends? 1 Not at all 2 Once or twice 3 Three to six times 4 More than six times	2/4 = 0; 1 = 1 'not at all'
In the past two weeks, how often have you had friends visit you? 1 Not at all 2 Once or twice 3 Three to six times 4 More than six times	2/4 = 0; 1 = 1 'not at all'
In the past two weeks, how often have you had contact by phone or letter with friends? 1 Not at all 2 Once or twice 3 Three to six times 4 More than six times	2/4 = 0; 1 = 1 'not at all'
Next Steps	
How often do you meet up with any of your friends?	¼ = 0; 5/8 = 1 'max once/twice a year'
1 Three or more times a week 2 Once or twice a week 3 Once or twice a month 4 Every few months 5 Once or twice a year 6 Less than once a year 7 Never | 8 Not applicable – do not have any	
MCS	
The next questions are about close friends. By close friends we mean other young people you feel at ease with or who you can talk to about things that are private. Do you have any close friends? 1 Yes; 2 No	2 = 0 'no'; 1 = 1 'yes'
When you are not at school, how often do you spend time with your close friends? 1 Most days; 2 At least once a week; 3 At least once month; 4 Less often than once a month; 5 Never	1/3 = 0; 4/5 = 1 '<1 × month/never' ¼ = 0; 5 = 1 'never'
Activities and going out	
NCDS	
We are interested in the things people do in their leisure time. Please indicate how frequently you…	
1 At least once a week 2 At least once a month 3 Several times a year 4 Once a year or less 5 Never / almost never	
go or walking or swimming	1/4 = 0; 5 = 1 'Never/almost never'
watch live sport	1/4 = 0; 5 = 1 'Never/almost never'
go to the cinema	1/4 = 0; 5 = 1 'Never/almost never'
go to a concert. theatre etc.	1/4 = 0; 5 = 1 'Never/almost never'
have a meal in a restaurant/c	1/4 = 0; 5 = 1 'Never/almost never'
How frequently do you go for a drink at a pub/c	1/4 = 0; 5 = 1 'Never/almost never'
Next Steps	
Please say how often you do play sport or exercise such as going walking, cycling, swimming or attending keep-fit classes. 1 At least once a week 2 At least once a month 3 Less often 4 Never	1/3 = 0; 4 = 1 'never' 1/2 = 0; 3/4 = 1 'less often/never'
Please say how often you go to the cinema, concerts, theatre or other live performances. 1 At least once a week 2 At least once a month 3 Less often 4 Never	1/3 = 0; 4 = 1 'never' 1/2 = 0; 3/4 = 1 'less often/never'
Please say how often you have a meal in a restaurant or café. 1 At least once a week 2 At least once a month 3 Less often 4 Never	1/3 = 0; 4 = 1 'never' 1/2 = 0; 3/4 = 1 'less often/never'

(Continued)

Table A1: (*Continued*)

Original variable and answer categories	**Recoded values**
Please say how often you go to a pub/bar or club. 1 At least once a week 2 At least once a month 3 Less often 4 Never	1/3 = 0; 4 = 1 ‘never’
	1/2 = 0; 3/4 = 1 ‘less often/never’
Bullying and hate crime	
Next Steps	
In the past 12 months, have you experienced name-calling, being the butt of jokes or other verbal abuse 1 Yes 2 No	2 = 0 ‘no’; 1 = 1 ‘yes’
In the past 12 months, have you had gossip spread about you, been ignored or other emotional abuse 1 Yes 2 No	2 = 0 ‘no’; 1 = 1 ‘yes’
MCS	
How often do other children hurt you or pick on you on purpose? 1 Most days 2 About once a week 3 About once a month 4 Every few months 5 Less often 6 Never	1/5 = 0; 6 = 1 ‘most days’
In the past 12 months has anyone done any of these things to you?	
Insulted you, called you names, threatened or shouted at you in a public place, at school or anywhere else? 1 Yes 2 No	2 = 0 ‘no’; 1 = 1 ‘yes’
Been physically violent towards you, e.g. pushed, shoved, hit, slapped or punched you? 1 Yes 2 No	2 = 0 ‘no’; 1 = 1 ‘yes’
Hit you with or used a weapon against you? 1 Yes 2 No	2 = 0 ‘no’; 1 = 1 ‘yes’
Subjective measures: trust and relying on others	
NCDS	
If you were sick in bed how much could you count on the people around you to help out. 1 …Not at all 2 A little 3 Somewhat 4 A great de¾	3/4 = 0; 1/2 = 1 ‘not at all/a little’
If you needed to talk about your problems and private feelings how much would the people around you be willing to listen… 1 …Not at all 2 A little 3 Somewhat 4 A great de¾	3/4 = 0; 1/2 = 1 ‘not at all/a little’
On a scale from 0–10 where 0 means you are not at all trusting of other people and 10 means you are extremely trusting of other people, how trusting of other people would you say you are? 0 Not at all … 10 Completely	4/10 = 0 ‘higher trust’ 0/3 = 1 ‘little trust’
Next Steps	
If you needed to talk about your problems and feelings, how much would the people around you be willing to listen? 1 Not at all 2 A little 3 Somewhat 4 A great d¾	3/4 = 0; 1/2 = 1 ‘not at all/a little’
On a scale from 0–10 where 0 means you are not at all trusting of other people and 10 means you are extremely trusting of other people, how trusting of other people would you say you are? 0 Not at all … 10 Completely	4/10 = 0 ‘higher trust’ 0/3 = 1 ‘little trust’
MCS	
I have family and friends who help me feel safe, secure and happy. 1 Very true; 2 Partly true; 3 Not true at all	3 = 0; 1/2 = 1 ‘not/partly true’
There is someone I trust whom I would turn to for advice if I were having problems. 1 Very true; 2 Partly true; 3 Not true at all	3 = 0; 1/2 = 1 ‘not/partly true’
There is no one I feel close to. 1 Very true; 2 Partly true; 3 Not true at all	3 = 0; 1/2 = 1 ‘not/partly true’
On a scale from 0–10, where 0 means not at all and 10 means completely, how much would you say you trust other people? 0 Not at all … 10 Completely	4/10 = 0 ‘higher trust; 0/3 = 1 ‘little trust’

Table A2: Disability category by cohort

NCDS[1]		Next Steps[2]			MCS[2]		
Disability category	**Prevalence among those with severe disability Imputed % (N)**	**Disability category**	**Prevalence among those with disability Weighted % (Unweighted N)**	**Prevalence among those with severe disability Weighted % (Unweighted N)**	**Disability category**	**Prevalence among those with disability Weighted % (Unweighted N)**	**Prevalence among those with severe disability Weighted % (Unweighted N)**
Overall	3.4 (432)		13.9 (677)	5.2 (238)		10.9 (1,133)	5.6 (559)
ESN (M)*	1.8 (64)	**Dyslexia**	7.9 (372)	2.1 (84)	**Dyslexia**	3.1 (319)	1.0 (98)
ESN (S)*	0.3 (34)	**Communication**	6.5 (322)	2.1 (96)	**Language/ Comm**	1.1 (98)	0.9 (77)
Physical*	0.9 (110)	**English**	0.1 (9)	(0)	**Reading**	0.1 (13)	(0)
Maladjusted*	0.5 (64)	**Maths**	1.9 (94)	0.5 (23)		–	–
		Physical (deaf/ sight)	2.6 (144)	1.2 (67)	**Physical (deaf/sight)**	0.9 (90)	0.7 (64)
		ADHD	1.1 (49)	0.5 (17)	**ADHD/ Autism**	3.4 (314)	2.2 (204)
		Behaviour	1.9 (72)	0.9 (35)	**Behaviour**	0.9 (79)	0.7 (51)
Receives special help	3.8 (490)				**Dyspraxia**	2.5 (246)	1.6 (157)
Would benefit from special help	1.6 (207)				**Mental health / depression**	0.3 (27)	0.2 (16)
Non-handi-capped	91.2 (11,633)	No SEN	86.1 (6,822)		No SEN	89.1 (10,401)	
N (All)	*12,762*		*74,99*			*11,534*	

Notes:

* **Bold** indicates type of disability status included in the measure.

[1] In NCDS, one question asked about disability so groups are exclusive.

[2] In Next Steps and MCS questions were multi-response, so categories are non-exclusive.

SEN = special educational needs.