



Review article

Public awareness, attitudes and beliefs regarding intellectual disability:
A systematic reviewKatrina Scior^{*}*Research Dept of Clinical, Educational and Health Psychology, University College London, 1-19 Torrington Place, London WC1E 7HB, United Kingdom*

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ABSTRACT

The general public's responses to people with intellectual disabilities influence the likely success or failure of policies aimed at increasing their social inclusion. The present paper provides a review of general population based research into awareness, attitudes and beliefs regarding intellectual disability published in English between 1990 and mid-2011. An electronic search using PsycINFO and Web of Science plus a hand search of the literature was completed. Most of the 75 studies identified consisted of descriptive surveys of attitudes. They tend to conclude that age, educational attainment and prior contact with someone with an intellectual disability predict attitudes, while the effect of gender is inconsistent. Eight studies examined lay knowledge about intellectual disability and beliefs about its causation in a range of cultural contexts. The impact of interventions designed to improve attitudes or awareness was examined by 12 studies. The evidence is limited by the fact that it is mostly based on relatively small unrepresentative samples and cross-sectional designs. It is concluded that overall, high quality research into general population attitudes to intellectual disability is limited. Public knowledge of intellectual disability and causal beliefs are particularly under-researched areas. There is a notable absence of well designed evaluations of efforts to reduce misconceptions about intellectual disability and tackle negative attitudes. Areas for future research are noted, including the need for well designed studies that consider awareness, attitudes and beliefs in relation to stigma theory.

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1. Introduction

Current policies governing services for people with intellectual disabilities in Western countries aim to maximise their social inclusion, independence and empowerment. Around the globe policies and services for this population are being put in place to assert their rights and tackle barriers to their inclusion (WHO, 2007). However, where lack of awareness, negative community attitudes and stigmatising beliefs prevail, attempts at greater community integration may well be met with resistance. Thus, understanding public responses to intellectual disability has important implications for the likely success of inclusion policies.

A recent large scale survey in the UK concluded that lay people's understanding of intellectual disability is still limited (Mencap, 2008). This is of concern as lack of awareness about individuals with intellectual disabilities has been linked to negative attitudes (Myers, Ager, Kerr, & Myles, 1998) and to stigmatising beliefs more prevalent in some cultures, such as that intellectual disability is due to possession by spirits (Hatton, Akram, Robertson, Shah, & Emerson, 2003; Hughes, 1983) or punishment for past sins (Hubert, 2006). To date though, concerns about stigma associated with intellectual disability are largely derived from research with the families of individuals with intellectual disabilities, not from general population based research.

While there are some suggestions that attitudes have become more positive over time (Rees, Spreen, & Harnadek, 1991), bullying is consistently a major concern noted by both children and adults with intellectual disabilities (Mencap, 2000) and disability hate crime has been recognised in some countries as a matter of serious concern (e.g. UK Crown Prosecution Service, 2010). This raises the question, to what extent discriminatory attitudes and behaviour arise from general low levels of awareness and more widely held negative attitudes, or rather from extreme prejudices held by a small minority.

While public awareness, beliefs about causes and their effect on stigma have been the subject of intense enquiry in the mental health field (Angermeyer & Matschinger, 2005; Corrigan et al., 2000; Jorm et al., 1997), it is unclear to what extent these factors have been studied at adult general population level in relation to intellectual disability. While the literature on children's attitudes towards peers with intellectual disabilities has been the focus of reviews (Nowicki & Sandieson, 2002; Siperstein, Norins, & Mohler, 2007), no systematic review of knowledge, attitudes and beliefs in the general adult population is currently available. For these reasons a systematic review of the literature on public awareness, attitudes and beliefs regarding intellectual disability seems timely.

1.1. Aims

This review addresses the following questions:

1. To what extent does the general public hold adequate knowledge about intellectual disability?
2. What attitudes towards people with intellectual disabilities prevail among the public? What beliefs about the causes of intellectual disability are prevalent among the public? Have there been any changes in attitudes and beliefs over the years?
3. What is the influence of socio-demographic characteristics, such as age, gender, educational attainment and prior contact with someone with intellectual disabilities, on these factors?
4. What are the results of cross-cultural comparisons of attitudes and beliefs towards intellectual disability?
5. Are there any studies evaluating the effects of interventions aimed at improving the public's understanding and attitudes? If so, what are their results?

It is hoped that these questions will advance our understanding and provide an evidence base for evaluations of future efforts at improving public awareness and attitudes and at promoting beliefs that may lead to greater social acceptance.

2. Method

2.1. Search strategy

The electronic databases PsycINFO and Web of Science were searched for studies covering the period from January 1990 to May 2011, by entering the keywords intellectual disability*/mental retardation/learning disability* in combination with general public; attitude*; knowledge; recognition; belief*; lay belief*; stigma; social distance; discrimination; prejudice in

each of these databases. The references of all included studies were searched to identify any further relevant studies. Finally the indexes of relevant journals were searched to identify any recent studies not yet picked up by electronic databases.

2.2. Review process

The initial search produced over 9000 potential references. Once papers which were clearly irrelevant and duplicates had been omitted, approximately 700 remained. To refine the search the following inclusion criteria were applied: (1) the paper was written in English; (2) only articles published in full (not solely as conference abstracts) in peer reviewed journals were considered to ensure some form of quality control, although it is recognised that some significant reports failed to meet this criterion (e.g. *Special Olympics*, 2003); (3) the focus of the study was on the general public of working age, including late adolescents (aged 16+). On this basis, studies that focused on high school students either in their early to mid teens (e.g. *Hastings, Sjöström, & Stevenage*, 1998) or of unspecified age (e.g. *Karnilowicz, Sparrow, & Shinkfield*, 1994; *Krajewski, Hyde, & O'Keefe*, 2002) were excluded. Research focused on children or professionals providing services to them, such as teachers, was excluded (e.g. *Balboni & Pedrabissi*, 2000; *Lifschitz & Glaubman*, 2002). Studies investigating attitudes and beliefs among particular subgroups, such as staff members or relatives of individuals with intellectual disabilities, were excluded (e.g. *Henry, Duvdevany, Keys, & Balcazar*, 2004; *Nurse, Rhode, & Farmer*, 1990). Finally, studies that focused on future service providers, such as medical students and trainee teachers, were excluded (e.g. *Boyle et al.*, 2010; *Hall & Hollins*, 1996; *Hampton & Xiao*, 2009; *Miller, Chen, Glover-Graf, & Kranz*, 2009). The evidence on service providers' attitudes and beliefs would merit a separate systematic review.

3. Results

3.1. Overview of studies

Seventy-five articles met the inclusion criteria, reporting findings pertaining to 68 studies. This literature was published at a very steady rate, with 17–18 papers published during every 5-year period up to 2004 and 23 papers published since 2005, generating an average 3.5 papers annually. With regard to locality, 32 articles reported research carried out in North America, 15 in Asia, 13 in Europe, 8 in Australasia, 6 in the Middle East, 3 in Africa and 1 in Central America; all of these were local or regional studies, none were national surveys. Only three studies used stratified random samples (*Burge, Ouellette-Kuntz, & Lysaght*, 2007; *Ouellette-Kuntz, Burge, Brown, & Arseneault*, 2010; *Pace, Shin, & Rasmussen*, 2010), all others recruited convenience samples. Of the 68 study samples, 33 consisted of community members of various designations, 29 of student samples and 6 studies sampled both students and members of the public. Twenty-four articles stated the response rate, ranging from 23% to a surprising 100% (*Rice*, 2009). Questionnaires were the favoured data collection method, while a few studies employed personal interviews (*Gabel*, 2004; *Hudson-Allez & Barrett*, 1996; *Kisanji*, 1995; *Sinson & Stainton*, 1990) or telephone interviews (*Burge et al.*, 2007; *Lau & Cheung*, 1999; *Ouellette-Kuntz et al.*, 2010). Studies focused on lay people's understanding of intellectual disability (U), attitudes (A), stigma, in terms of social distance and comfort during interactions (S), and beliefs (B). A few studies evaluated interventions aimed at increasing awareness or improving attitudes among lay people (E), see *Table 1*.

3.2. Lay knowledge about intellectual disability

Studies presented under this heading have addressed the question; to what extent does the general public have an "adequate" understanding of intellectual disability. Only eight articles either explicitly focused on lay people's knowledge about intellectual disability, or included this in their enquiries. Their findings suggest that members of the public frequently show a limited understanding of the concept of intellectual disability (*Gordon, Feldman, Tantillo, & Perrone*, 2004), and synonymous terms, and that awareness of intellectual disability varies considerably between different cultures. On this note, Israelis of Western origin showed more accurate as well as a greater breadth of knowledge about intellectual disability than those of Eastern origin (*Aminidav & Weller*, 1995). When Ethiopians were asked to estimate the relative prevalence of intellectual disabilities, they erroneously estimated conditions such as schizophrenia to be more common (*Alem, Jacobsson, Araya, Kebede, & Kullgren*, 1999). Lay people in Japan were found to underestimate the prevalence of intellectual disability at 0.5% and to markedly overestimate the proportion of people with intellectual disabilities whose disability is severe, leading the authors to suggest that many lay people may not regard 'mild' intellectual disability as such (*Tachibana*, 2006; *Tachibana & Watanabe*, 2003).

Three studies used case vignettes to assess lay knowledge. Presented with a vignette of someone with symptoms of a severe intellectual disability, only around half of parents and community health workers in India were able to recognise the condition (*Madhavan, Menon, Kumari, & Kalyan*, 1990). *Ojha, Gupta, Dhillon, and Menon* (1993), in reporting the results of a public awareness programme with slum dwellers in New Delhi, reported that recognition of intellectual disability increased from one of 34 respondents at baseline to 19 of 30 at the end of the programme. As the vignette used is not included in their report, it is not possible to judge the severity of the disability depicted though; arguably more severe symptoms should elicit higher recognition rates. Finally, in a study that presented lay people from six different ethnic groups in the UK and Asia with a vignette depicting someone with a mild intellectual disability, across the entire sample only 24% could recognise

Table 1
Overview of studies included in the review.

Study	Location	Focus	Sample	N	Method	Results
Ahlborn, Panek, and Jungers (2008)	USA, Midwest	A, B	Psychology students, mean age = 19.7 years	320	12-item Semantic differential scale	Attitudes did not differ on basis of factors intrinsic to person with intellectual disabilities (ID), e.g. age or gender
Akrami et al. (2006)	Uppsala, Sweden	A	Students, mean age = 23.9 years	235	(1) Classical & modern attitudes scale towards people with ID, developed by authors (2) Social Dominance Orientation Scale (Pratto, Sidianus, Stallworth, & Malle, 1994) Key Informant Questionnaire (Wig et al., 1980)	- Males more likely to show prejudicial attitudes - Modern prejudice scale had better discriminant validity than classical prejudice scale
Alem et al. (1999)	Ethiopia	B, U	Lay people, aged 30–83 years & key informants in a rural district	100		Of seven common neuropsychiatric disorders, ID regarded as 2nd most serious condition after schizophrenia
Aminidav and Weller (1995)	Israel	U	Israeli Jews from Western, Iraqi and Yemenite backgrounds	120	(1) Open-ended question, “What is mental retardation?” (2) 10-item Information questionnaire (Efron & Efron, 1967)	Israelis of Western origin showed more accurate and greater breadth of knowledge about ID than those of Eastern origin
Antonak (1994)	USA	U Development of new measure	Students, aged 18–56 years	251	40-item Test of Knowledge About Mental Retardation, developed by author	Results largely about measure's psychometric properties
Antonak, Fiedler and Mulick (1993)	USA	A Development of attitude scale	Students (+109 professionals)	139	32-item Attitudes towards Mental Retardation and Eugenics scale (AMRE), developed by authors	Results largely about measure's psychometric properties
Antonak and Harth (1994)	USA	A	Students and professionals Students mean age = 30 years	230	Mental Retardation Attitude Inventory-Revised (MRAI-R)	Best demographic predictors of attitudes: familiarity followed by education
Antonak et al. (1995)	USA	A	Students in health/human services ($n = 259$), other subjects ($n = 192$); 129 professionals	572	(1) AMRE (Antonak et al., 1993) (2) MRAI-R (Antonak & Harth, 1994)	- Students less likely to endorse eugenic principles re. people with mild to moderate ID, than severe to profound - Educational attainment and familiarity with people with ID inversely related to endorsement of eugenic principles for all four levels of ID
Beckwith and Matthews (1994)	Australia	A, S Comfort in interacting with people with ID	Students, of these 135 enrolled on ID degree course	468	(1) Interaction with Disabled Persons (IDP) scale (Gething, 1991), adapted (2) Social Desirability Scale (MCSDS) (Crowne & Marlowe, 1960)	- Contact, frequency of contact and age predicted comfort in interacting with hypothetical individuals with ID - IDP and SDS scores not correlated - Completing ID programme associated with more positive attitudes
Beh-Pajooh (1991)	Northern England, UK	A, E Impact of link programme between college and school for kids with severe ID; compared high, low and no contact	College students, aged 16–19 years	132	54-item questionnaire adapted from McConkey, Naughton, and Nugent (1983), assessing emotional reactions and attitudes	- Contact with students with ID in college associated with more positive attitudes and emotional reactions - Most marked differences between contact and no contact groups: when asked about meeting hypothetical student with severe ID: - 11% of former vs 71% of latter said they would feel embarrassed. - 11% of former vs 81% of latter said they would feel scared - 63% of former said find it a good experience, but only 8% of latter

Table 1 (Continued)

Study	Location	Focus	Sample	N	Method	Results
Brown et al. (2011)	Ontario, Canada	A Behavioural intentions towards peers with ID or physical disabilities	Secondary school pupils, aged 14 (<i>n</i> = 189) and 17 (<i>n</i> = 130) years	319	(1) Behavioural Intentions Questionnaire, developed by authors (2) Open-ended questions re. comfort during interactions	- Respondents more willing to engage in more distant roles with peers with ID than social/ personal roles - Behavioural intentions towards peers with ID more negative than towards peers with physical disabilities - People's views about disability multi-layered - Consensus among participants about rights of people with DS to be included in society
Bryant et al. (2006)	Yorkshire, UK	B Beliefs about Down's Syndrome (DS)	Mixed	76	Q Sort	- People's views about disability multi-layered - Consensus among participants about rights of people with DS to be included in society
Burge et al. (2007)	Ontario, Canada	A, S	Stratified random community sample	680	Telephone poll: (1) Mod. version of survey used in Multinational study of attitudes towards individuals with ID (Special Olympics, 2003) (2) Social distance sub-scale of MRAI-R (Antonak & Harth, 1994) Scale of Attitudes towards Disabled Persons (Antonak, 1982)	- <1% believed adults with ID should not work - 65% felt jobs in integrated work places most suitable employment for people with ID - Being male, older, less educated and unemployed associated with more pro-segregation views
Choi and Lam (2001)	Korea & USA	A	Korean & Korean-American students	359	Scale of Attitudes towards Disabled Persons (Antonak, 1982)	- Contact associated with more positive attitudes - No differences between Korean American and Korean students on attitudes to physical disability, but Koreans more negative re. ID - Graduate students held more favourable attitudes than undergraduate students
Cuskelly and Bryde (2004)	Australia	A Sexuality	Community sample (<i>n</i> = 63), parents (<i>n</i> = 43) and staff (<i>n</i> = 62) 33% of community sample psychology students	63	Attitudes to Sexuality Questionnaire (ID version), developed by authors	- Community attitudes to sexuality of people with ID generally positive - Age (aged 60+) associated with more conservative attitudes to sexuality of this group - No differences in attitudes between community sample, parents and staff once age accounted for
Cuskelly and Gilmore (2007)	Australia	A Sexuality	Community sample	261	Attitudes to Sexuality Questionnaire-ID (Cuskelly & Bryde, 2004) and parallel general population version, developed by authors	- Being male and older associated with more negative attitudes to sexuality of people with ID - Views about parenting by this group more cautious than for other aspects of sexuality
Dhillon and Chaudhuri (1990)	India	A, B	Six groups of <i>n</i> = 20, incl. parents of typically developing children, professionals and parents of children with ID	120	Semantic differential scale consisting of 21 bipolar adjective scales measuring 3 factors: evaluation, potency, activity	- Image of ID is mainly a negative one - Parents of typically developing children held slightly more negative views of ID
Eayrs, Ellis, and Jones (1993)	UK	A, B, S Responses to three different ID labels	Community sample	111	(1) 12-item social distance scale (2) 24-item semantic differential scale to ascertain a stereotype of the labelled group (3) 24-item scale to assess beliefs about abilities of labelled individuals (4) 10-item scale to assess views on rights of these individuals (5) Open ended items re. perceptions of different ID labels All developed by authors	- No effect of label on social distance - Public perception of term 'learning difficulties' more favourable than terms 'mentally subnormal' and 'mentally handicapped'; former seen as more able but also as less deserving of special support

Eggert and Berry (1992)	Germany	A	Grammar school pupils, aged 15–20 years	119	Attitudes questionnaire (McConkey et al., 1983)	- German students more confident about meeting someone with ID and more positive attitudes than previous Irish and Australian adolescent samples (but also older than comparison samples) - Evidence of lots of more negative attitudes, e.g. only 15% agreed that people with ID experience similar problems as them, only 25% felt they should use cafes more often and 15% felt should not be allowed to vote
Esterle et al. (2008)	Toulouse, France	A Sexuality	Lay people recruited in public places	367	Measure designed for study: 64 cards each with brief vignette, question and 10-point Likert scale judging acceptability of sexual intercourse	- Lay people's judgements about acceptability of sexual intercourse involving a person with ID depend on 4 interacting factors: (1) use of contraception; (2) person's level of autonomy; (3) whether partner of a similar age; (4) whether partner of similar level of disability - Younger people more accepting of sexuality of people with ID - In India people with ID are mostly kept at home as seen to bring shame on family; mothers' role to care for them - Religious beliefs have marked influence on views and beliefs about ID
Gabel (2004)	USA, Midwest	B How do Indian immigrants think and talk about ID?	Hindi Indian 1st generation immigrants to US	20	In-depth interviews	- Life expectancy of people with DS significantly underestimated - Expectations of adult attainments of people with DS quite optimistic - Both community members and teachers held stereotype of people with DS as exceptionally happy and affectionate - Only 20% saw inclusive education as best option, though most saw benefits of inclusion for both children with DS and peers - Understanding of concept of ID frequently poor - Out of 13 disabilities, ID rated lowest as likely friend, and as least desirable for social interactions
Gilmore et al. (2003)	Australia	A, U Knowledge about DS and attitudes towards educational inclusion of children with DS	Community members	2053	Questionnaire to assess knowledge & attitudes re. DS, adapted from Wishart and Manning (1996)	- Predictors of attitudes: prior media exposure to people with DS, quality of contact and social desirability, accounting for 20%, 10% and 7% of variance respectively - Documentary associated with more positive affect than drama - Predictors of intention to volunteer: type of media presentation (17%) and quality of previous contact (6%); those who watched documentary and had previous positive contact experiences more willing to volunteer
Gordon et al. (2004)	USA, Midwest	A, U	Psychology students	218	(1) Knowledge scale; (2) 7-item social distance scale Both developed by authors	- Community members are opposed to exclusion of people with ID; agree that people with ID are similar to themselves; ambiguous about need for sheltering/protection of people with ID; only somewhat agree with empowerment
Hall and Minnes (1999)	Canada	A, E Attitudes to DS; impact of 3 different television portrayals of young adult male with DS on attitudes	Students	92	(1) Attitudes towards Disabled Persons Scale (Yuker et al., 1960); (2) Comfort Scale (Marcotte & Minnes, 1989); (3) Volunteering Intentions Scale, developed by authors (4) Social Desirability Subscale of Personality Research Form (Jackson, 1974); (5) Contact Questionnaire, developed by authors	
Henry, Keys, Balcazar, et al. (1996)	USA	A	Community members (+340 staff members)	152	(1) CLAS-MR (Henry, Keys, Balcazar, et al., 1996) (2) Demographics Questionnaire	

Table 1 (Continued)

Study	Location	Focus	Sample	N	Method	Results
Henry, Keys, Jopp, and Balcazar (1996)	USA	A	104 students & 283 community members	387	(1) CLAS-MR, developed by authors; (2) Community Attitudes towards Mental Illness Scale (Taylor & Dear, 1981); (3) Scale of Attitudes towards Disabled Persons (Antonak, 1982); (4) Balanced Inventory of Social Desirability (Paulhus, 1984)	- No significant correlations between CLAS-MR subscales and subscales on Social Desirability measure
Horner-Johnson et al. (2002)	Japan	A	Students	286	(1) CLAS-MR (Henry, Keys, Balcazar, et al., 1996); (2) MRAI-R (Antonak & Harth, 1994) (3) AMRE (Antonak et al., 1993) (4) MCSDS short form (Strahan & Gerbasi, 1972)	- Those with friend or relative with ID more likely to endorse rights of people with ID - No correlation between social desirability and other measures
Hudson-Allez and Barrett (1996)	UK	A, E Neighbours' attitudes to people with ID moving into ordinary houses	Neighbours of ID community homes	150	Interview	- Positive attitude change not evident immediately, but at 6 to 12 months follow-up; conclude when newcomers arrive fears are reduced and attitudes slowly improve; even though majority may hold positive attitudes, negative minority can generate fears in majority and block new developments - Attitudes at baseline neutral, not negative as predicted - Older interviewees more concerned about new neighbours, no effect of gender and contact - Attitudes and social distance correlated - Age & education affect attitudes to sexuality of people with ID, but not gender, contact or social class - Older, unemployed respondents discriminated most against people with ID
Karellou (2003)	Greece	A Sexuality	Public, no details	301	Greek Sexuality Attitudes Questionnaire-ID version, developed by author	- Attitudes to people with ID more negative than to people with paraplegia on: (1) emotional issues; (2) responsibility & control; (3) right to personal choice - Attitudes to both groups similar on sexual needs
Katz et al. (2000)	Israel	A Sexuality	Students, aged 18–35 years	135	(1) 30-item attitudes to sexuality scale, 2 versions: ID & paraplegia, developed for study (2) California F scale (Adorno, Frenkel-Brunswick, Levinson, & Sanford, 1950)	- Those high on authoritarianism expressed more negative attitudes to sexuality of both groups
Kisanji (1995)	Tanzania	A, B	44 Tribal elders, 7 executives & government officials (+10 headteachers, 45 teachers)	51 (excl. teachers)	Interviews	Tribal elders named God's will and witchcraft (44% and 39%) as most likely causes of ID. In contrast, teachers saw disease as the most likely cause, and only 13.3% named God's will and 6.6% witchcraft as likely causes
tenKlooster, Dannenberg, Taal, Burger, and Rasker (2009)	Netherlands	A	Peers of nursing students as controls (+ 78 nursing students)	43	(1) Attitudes towards Disabled Persons Scale (Yuker et al., 1960) (2) Scale of Attitudes towards Disabled Persons (Antonak, 1982) (3) CLAS-MR short form (Henry, Keys, Balcazar, et al., 1996)	- Controls less likely than nursing students to endorse empowerment and similarity of people with ID - Having a relative or friend with a physical disability predicted positive attitudes to physical disability across whole sample, but same not case for ID

Kobe and Mulick (1995)	USA, Midwest	A, E Effects of 10-week course on psychology of ID	Students	37	AMRE (Antonak et al., 1993)	Following 9 × 2 h lectures + minimum of 20 h of direct contact with person with ID found: - No change in attitudes - Increase in self-rated knowledge of ID
Lau and Cheung (1999)	Hong Kong	A, S	Community Members	822	Telephone interviews, 9 items designed to tap into control, rejection & keeping away	- Discrimination higher towards people with mental health problems (MHP) than ID - Contact in past 6 months associated with less discrimination for both conditions - Education predicted discrimination towards people with ID, not age or gender - Social distance much lower for ID than MHPs: only 8.3% would mind former as neighbour (34.7% for MHPs), and 6.1% as colleague (23.9% for MHPs) - Even very brief information emphasising capabilities of persons with ID can result in more positive attitudes - Label in itself did not affect attitudes - Females held more positive attitudes Only approx. half of parents and community health workers able to recognise ID in vignette
MacDonald and MacIntyre (1999)	Canada	A, E Effects of label change and positive information on attitudes	College students, mean age = 21.8 years, split into 4 groups	168	(1) MRAI-R (Antonak & Harth, 1994) (2) Vignette emphasising skills and activities of person with ID or ADHD	- Even very brief information emphasising capabilities of persons with ID can result in more positive attitudes - Label in itself did not affect attitudes - Females held more positive attitudes Only approx. half of parents and community health workers able to recognise ID in vignette
Madhavan et al. (1990)	Rural Hyderabad, India	A, U	246 parents & 43 community health volunteers (+67 teachers and 37 midwife trainees)	289	Case vignette of boy with severe ID followed by 5 open ended questions	Identified 2 core prototypes for ID: (1) needs help/dependent; (2) slow learner/comprehension problems Three factors had effect on judgment of acceptability of sexual intercourse involving person with ID: (1) use of contraception; (2) person's level of autonomy; (3) whether partner of a similar age. Contrary to Esterle et al. (2008), partner's level of disability had no effect
McCaughey and Strohmer (2005)	USA	A, B Prototypes of 6 disability groups	Students	122	Participants asked to list 10 phrases that define/describe person	- ID seen as less likely to be caused by psychosocial stress than MHPs and more likely by supernatural retribution than depression, alcoholism and tuberculosis - Attributing ID to supernatural retribution associated with increased belief in prayer and negative attitudes - Age and education most important predictors of causal beliefs - Attitudes very negative towards people with ID and people with MHPs - No effect of gender on attitudes
Morales et al. (2010)	Mexico	A Sexuality	Convenience sample, few details	120	Measure designed by Esterle et al. (2008): 64 cards each with brief vignette, question and 10-point Likert scale judging acceptability of sexual intercourse	- ID seen as less likely to be caused by psychosocial stress than MHPs and more likely by supernatural retribution than depression, alcoholism and tuberculosis - Attributing ID to supernatural retribution associated with increased belief in prayer and negative attitudes - Age and education most important predictors of causal beliefs - Attitudes very negative towards people with ID and people with MHPs - No effect of gender on attitudes
Mulatu (1999)	Ethiopia	A, B, S Comparison of responses to 9 different conditions	Community Sample, aged 17–70 years	450 n = 50 per group	Interviews: vignette of 9 conditions (incl. ID, mental & physical illnesses), followed by questions on: (1) attitudes; (2) causal beliefs; (3) treatment beliefs	- ID seen as less likely to be caused by psychosocial stress than MHPs and more likely by supernatural retribution than depression, alcoholism and tuberculosis - Attributing ID to supernatural retribution associated with increased belief in prayer and negative attitudes - Age and education most important predictors of causal beliefs - Attitudes very negative towards people with ID and people with MHPs - No effect of gender on attitudes
Nagata (2007)	Lebanon	A	Students	94	47-item survey (Equal Opp. Commission, Hong Kong, 2000) comparing attitudes to 5 categories: ID, former MHPs, physical disability, deaf, blind	- ID seen as less likely to be caused by psychosocial stress than MHPs and more likely by supernatural retribution than depression, alcoholism and tuberculosis - Attributing ID to supernatural retribution associated with increased belief in prayer and negative attitudes - Age and education most important predictors of causal beliefs - Attitudes very negative towards people with ID and people with MHPs - No effect of gender on attitudes
Narukawa and Maekawa (2004)	Japan	A	Students & lay people	682	Construction of Causal Model based on data from Narukawa (1995) and Narukawa and Nasu (2002)	Can have high level of goodwill towards people with ID without affirming their abilities
Narukawa et al. (2005)	Tokai, Japan	A	Students, aged 18–22 years (reanalysis of data from Narukawa, 1995 and Narukawa & Nasu, 2002)	415	28-item attitude survey, based on Narukawa (1995)	Experiences of contact during school years influence attitudes to integration, affirmation of abilities and positive behavioural intentions

Table 1 (Continued)

Study	Location	Focus	Sample	N	Method	Results
Nosse and Gavin (1991)	USA, Midwest	A, E Impact of contact on attitudes	Students	31 & 23 controls	(1) Adjective generation technique (Allen & Potkay, 1983) (2) Semantic differential scale	Direct contact experience improved attitudes and reduced use of anxiety related adjectives
Ojha et al. (1993)	New Delhi, India	B, U, E Effects of integrated education programme consisting of films, slides & vignette on public awareness of ID	Slum dwellers	43 (unclear)	Questionnaire developed by NIMH, India	- Increased awareness of ID post-intervention - Pre: parents' fault most common cause cited (32.65), post: pre-natal problems (32.6%) - Beliefs re. support: pre: 86% viewed medical services as most appropriate, post: special education seen as most appropriate by majority - Idea in marriage as cure evident pre- but not post
Oliver et al. (2002)	USA, Midwest	A Sexuality	Students & older adults recruited from 2 day centres	149 students, 42 older adults	18-item scale of attitudes to sexuality of individuals with ID (Lunsky & Konstantareas, 1998)	- Differences in attitudes towards sexuality of person with ID and typically functioning adult mainly related to marriage and parenthood - With increased age attitudes to sexuality more conservative, regardless of disability or not
Ouellette-Kuntz et al. (2010)	Ontario, Canada	S	Stratified random community sample (mean age = 50 years)	625	Telephone survey: 8-item social distance subscale of MRAI-R (Antonak & Harth, 1994)	- Being older and less educated associated with greater social distance to people with ID, no effect of gender - Having family member with ID and perceiving average level of ID as mild associated with lower social distance - Overall limited variability in social distance; authors question whether views expressed overly favourable
Ouimet and de Man (1998)	Canada	S	Community sample, aged 19–74 years	85	(1) AMRE (Antonak, Fielder & Mulick, 1993) (2) State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) (3) Self-Esteem Scale (Rosenberg, 1965) (4) Locus of Control Scale (Levenson, 1981)	Factors associated with eugenic attitudes: being male, less educated and higher on trait anxiety with external locus of control
Pace et al. (2010)	USA	A Attitudes to people with DS	Stratified random community sample	5399	Questions part of US HealthStyles survey	- 65.7% agreed that most adults with DS should be able to work - 28.9% agreed that including people with DS in ordinary classes is distracting, 25.3% that students with DS should go to special schools - Factors associated with more positive attitudes: female, contact, higher education, not age
Panek and Jungers (2008)	USA, Midwest	B	Psychology students, mean age = 19.5 years	116	Semantic differential scale with 3 factors: activity, evaluation, potency	- Perceptions differed according to causality: ID due to genetics evaluated most positively, self-inflicted ID (drinking cleaning fluid aged 6) most negatively
Rees et al. (1991)	Canada	A, E Evaluation of historic changes & impact of contact & info as part of 2-year ID course	106 students enrolled on ID course, 83 student controls	189	Semantic differential scale (Replication of study by Spreen (1977))	- Females rated people with ID more positively - Positive shift in attitudes from 1977 to 1991 - Attitudes in both ID students and controls became more positive over course of study
Rice (2009)	USA	A	Students	295	MRAI-R (Antonak & Harth, 1994)	- Gender had effect on 21 of 29 items, but not on subtle derogatory beliefs

Rillotta and Nettelbeck (2007)	Adelaide, Australia	A, E Effects of awareness of disability (ADP) programme	2ndary school pupils & ex-pupils, mean age = 20.9 years	259	Attitudes towards persons with ID questionnaire, adapted from Down (unpubl.)	- Pupils who completed ADP programme showed more positive attitudes than non-completer - Contact and ADP programme accounted for 5% and 4% respectively of variance in attitude change scores, being older and female jointly for a further 7% - Contact provided through volunteering at Special Olympics did not have significant positive effects on attitudes or perceptions of their competence - Minimal (as opposed to no or ample contact) had strongest association with increasingly positive attitudes
Roper, P.A. (1990)	USA	A, B, E Beliefs about competence of people with ID; effect of volunteering at Sp. Olympics on social distance & perception of individuals with ID	Special Olympics volunteers, aged 12–70 years	369	(1) Semantic differential scale (2) Questionnaire on beliefs about people with ID and Special Olympics, designed for study	
Roper, P. (1990)	USA	B, S, E	Special Olympics volunteers, aged 12–70 years (Same sample as Roper, P.A. (1990))	369	(1) Semantic differential scale (2) 13-item social distance scale, developed for study	See Roper, P.A. (1990)
Saetermore et al. (2001)	California, USA	A, S Stigma towards 19 disabilities among 4 different ethnic groups	469 students & 102 community members, mean age = 32.3 years	571	5-item social distance scale re. 19 disabilities, adopted from Westbrook et al. (1993)	- MHPs more stigmatised than ID or DS by three ethnic groups, while Asian-Americans rated both similarly negatively - Severe physical and mental disability more stigmatised by Asian-Americans than by other ethnic groups - Asian-Americans born in Asia showed higher stigma than those born in USA - Results largely about measure's psychometric properties
Scattone and Lee (1999)	California, USA	A Development of new measure	Students from 4 different ethnics groups	572	Scale rating social desirability of 19 disabilities, adopted from Westbrook et al. (1993)	
Schwartz and Armony-Sivan (2001)	Israel	A	Students	149	CLAS-MR (Henry, Keys, Balcazar, et al., 1996): 2 equivalent versions: ID & MHPs	- Empowerment and Similarity subscales endorsed more than Exclusion - More likely to endorse exclusion for people with MHPs than for those with ID - Results of US study (Henry, Keys, Balcazar, et al., 1996; Henry, Keys, Jopp, & Balcazar, 1996) more positive than present Israeli sample - No effect of prior contact on attitudes - None of facility or neighbourhood variables had significant effect on facility's perceived negative impact by themselves, but only in interaction - Visiting the facility did not have positive effect on attitudes by itself, but interaction between visiting and respondent factors did (e.g. positive effects on attitudes of neighbours who had young children and visited facility)
Schwartz and Rabinovitz (2001)	Israel	A, E Impact of visiting facility for residents with ID	Neighbours of residential facilities	208	Questionnaire designed for study re. views of residential facilities for people with ID in neighbourhood	

Table 1 (Continued)

Study	Location	Focus	Sample	N	Method	Results
Scior et al. (2010)	UK & Hong Kong	A	Lay people: 149 Hong Kong residents (mean age = 37.17 years) & 135 white British (mean age = 33.92 years)	284	CLAS-MR (Henry, Keys, Balcazar, et al., 1996)	- HK Chinese adults higher on Exclusion and Sheltering and lower on Similarity than white British adults - Age had modest effect on attitudes, older respondents more in favour of Sheltering - Gender had only small effect, females more in favour of empowerment, other gender differences disappeared when other socio-demographics accounted for
Scior and Furnham (2011)	UK, Hong Kong, Singapore, India	U Development of new measure	Lay people from 6 different ethnic groups	1376	Intellectual Disability Literacy Scale: (1) knowledge of ID; (2) causal beliefs; (3) treatment beliefs; (4) social distance, developed by authors	- Results largely about measure's psychometric properties - Across entire mixed-ethnicity sample only 24% could recognise mild ID in vignette
Scotti, Slack, Bowman, and Morris (1996)	West Virginia, USA	A Sexuality	Psychology students	135	(1) Perceptions of Sexuality Scale, developed by authors (2) Global Perceptions Scale, adapted from Aging Semantic Differential (Rosencranz & McNevin, 1969)	- Females showed more positive attitudes - Sexual behaviour of people with ID rated as less acceptable than in students
Sigelman (1991)	USA	A, S	Lay people	102	Social distance scale re. 10 stigmatised groups	- Global perceptions of students more positive than of people with ID - Social distance 5th highest for ID (higher for sexual herpes, gay people, MHPs and ex-convicts) - Participants portrayed themselves as more accepting than 'most people' and overestimated social distance most people would prefer to stigmatised groups
Sinson and Stainton (1990)	USA	A	Lay people from urban & rural areas, aged 18–68 years. 254 of 720 Stage 1 participants included in Stage 2	720	Stage 1: Questionnaire re. knowledge, awareness & integration Stage 2: Information pack followed by interviews	- Media coverage on ID had negligible effect, only noted when person had particular interest. Only exception BBC's QED programme that presented highly gifted autistic individuals in a positive light and as on equal terms (mentioned by name by 7%)
Tachibana (2005)	Japan	A	Parents recruited through 11 primary schools	2381	Questionnaire: open ended questions re. past experience with individuals with ID and attitudes towards this group	- Negative contact experiences with individuals with ID, especially in childhood, strongly associated with negative attitudes - Most respondents judged self as holding more positive attitudes than average person and ascribed overly negative attitudes to the latter
Tachibana (2006)	Japan	U	Parents recruited through 11 primary schools (Same sample as Tachibana (2005))	2381	Questionnaire: prevalence estimates of: ID, severe ID, associated difficulties, genetic causes	- Prevalence of ID underestimated at 0.5% - ID due to hereditary causes estimated at 10% - Markedly overestimated proportion of people with ID whose disability is severe
Tachibana and Watanabe (2003)	Japan	A, U	Parents recruited through 2 primary schools	375	25-item scale: attitudes, knowledge and beliefs re. intellectual disability, developed by authors	- Prevalence of ID underestimated at 0.5% - ID due to hereditary causes estimated at 10% - No clear association between prevalence estimates & attitudes
Tachibana and Watanabe (2004a)	Japan	A Results compared to Japanese surveys completed 20 & 40 years earlier	Parents recruited through 11 primary schools (Same sample as Tachibana (2005))	2381	16-item scale: attitudes to integration of people with ID, developed by authors	- Community living not well accepted, only 30% strongly agreed - Over time attitudes in Japan have become more positive

Tachibana and Watanabe (2004b)	Japan	A	Parents recruited through 11 primary schools (Same sample as Tachibana (2005))	2381	16-item scale: attitudes to integration of people with ID, developed by authors	- Being younger and having friend who has family member with ID associated with more positive attitudes - Those with family member with ID showed less positive attitudes than expected
Townsend and Hassall (2007)	Auckland, NZ	A	Attitudes to unified sports	2ndary school pupils, aged 16–17 years	107	Questionnaire: 9 items re attitudes to integrated sports; 5 items re knowledge of Special Olympics - Attitudes to unified sports positive overall - Adolescents less positive about unified sports than younger children - Girls more positive about unified sports than boys
Varughese and Luty (2010)	UK	A	Lay people, mean age = 47.9 years	186	5 item Attitude to Mental Illness Questionnaire (AMIQ, Luty, Fekadu, Umoh, & Gallagher, 2006)	- Looking at picture of man with DS while completing measure associated with more positive attitudes than completing measure alone
Weller and Aminidav (1992)	Israel	A	Lay people from 3 ethnic groups	360	Family Relations Test, used to assess emotional reactions to individuals with ID	- Country of origin, gender, socio-economic status and religiosity associated with attitudes - Attitudes to people with mild ID less favourable than to those with physical disabilities, severe ID least favourable
Westbrook et al. (1993)	Australia	A	Health practitioners from Chinese, Italian, German, Greek, Arabic & English Australian communities	655	Social distance scales to rate attitudes of people in respondents' communities towards 20 disability groups	- Attitudes towards 19 of 20 disabilities differed by ethnic group - Relative degree of stigma attached to different disabilities very similar across communities, people with ID among least accepted groups
Yazbeck et al. (2004)	Australia	A	Students ($n = 163$); community members ($n = 127$); (+disability services professionals	290	(1) CLAS-MR (Henry, Keys, Balcazar, et al., 1996); (2) MRAI-R (Antonak & Harth, 1994) (3) AMRE (Antonak et al., 1993) (4) MCSDS short form (Strahan & Gerbasi, 1972)	- Younger people & more educated showed more positive attitudes, no effect of gender - Prior contact associated with more positive attitudes on MRAI-R, but not on other scales - No clear association between social desirability and attitudes scores
Zaleski, Eysenck, and Eysenck (1995)	Poland	A	Adults	249	(1) Scale re. attitudes to 12 marginal groups (2) Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975)	- Respondent's personality and characteristics of marginal groups, including people with ID, interact in determining attitudes
Zsombok et al. (1999)	Ohio, USA	A	Lay people	206	(1) Scale of Attitudes towards Disabled People (SADP) (Antonak, 1992); (2) Behavioural measure (petition for/ against residential facility for people with ID in neighbourhood)	- Direct (survey) and indirect (mock petition drive) attitude measures only moderately correlated (.40) - Positive responses to indirect measure outweighed negative responses by 20%

intellectual disability (Scior & Furnham, 2011). Respondents from Asian and African backgrounds were less likely to recognise intellectual disability than white British people.

3.3. Public attitudes towards and beliefs about intellectual disability

Attitude surveys made up the largest proportion by far of the studies reviewed, with 66 of the 75 papers reporting data on lay attitudes. Evidence from some studies conducted in Western countries suggests overall that attitudes that are generally pro-inclusion (Henry, Keys, Balcazar, & Jopp, 1996; Scior, Kan, McLoughlin, & Sheridan, 2010). Several studies have examined the extent to which lay people view individuals with intellectual disabilities as experiencing similar concerns, emotions and life goals as themselves, with varying results. In a German study, only 15% of adolescents agreed that people with intellectual disabilities experience similar problems as them (Eggert & Berry, 1992). In contrast, students and community members in the US, Israel, Japan, the UK and Hong Kong agreed that they were similar, albeit in Israel, Japan and Hong Kong agreement was very modest (Henry, Keys, Balcazar, et al., 1996; Horner-Johnson et al., 2002; Schwartz & Armony-Sivan, 2001; Scior et al., 2010).

In comparative studies of attitudes to social interactions with members of different groups, people with intellectual disabilities consistently emerge as one of the least desirable groups (Gordon et al., 2004; Nagata, 2007; Westbrook, Legge, & Pennay, 1993). Further, behavioural intentions towards them are more negative than towards people with physical disabilities (Brown, Ouellette-Kuntz, Lysaght, & Burge, 2011; Katz, Shemesh, & Bizman, 2000). The public appear to want greater social distance though from people with severe mental health problems, such as schizophrenia, than from people with intellectual disabilities (Lau & Cheung, 1999; Saetermore, Scatone, & Kim, 2001; Sigelman, 1991). Finally, lay people appear to hold more negative attitudes towards individuals with severe rather than mild intellectual disabilities (Antonak, Mulick, Kobe, & Fiedler, 1995; Weller & Aminidav, 1992).

Negative attitudes have been linked in part to misconceptions about the capabilities of people with intellectual disabilities, such as that most have severe disabilities (McCaughey & Strohmer, 2005). Lay people who recognise that most intellectual disabilities are *mild* show lower social distance towards this population (Ouellette-Kuntz et al., 2010). It has been suggested that providing even brief information that emphasises the capabilities of individuals with intellectual disabilities can result in more positive attitudes (MacDonald & MacIntyre, 1999). Furthermore it has been suggested that media portrayals that present individuals with disabilities in a positive light and on equal terms may have particular salience for lay people, who are otherwise used to media coverage that is designed to elicit pity (Sinson & Stainton, 1990).

Although at least in highly developed societies there appears to be broad consensus about the right of people with intellectual disabilities to be included in society (Bryant, Green, & Hewison, 2006; Henry, Keys, Balcazar, et al., 1996; Scior et al., 2010), a small but significant minority still believe that they should be educated, live and work in segregated environments (Burge et al., 2007; Gilmore, Campbell, & Cuskelly, 2003; Pace et al., 2010; Tachibana & Watanabe, 2004a). One should be cautious though not to assume that such views necessarily arise from hostile attitudes, as some may genuinely believe that integration, for example in schools, is not always in the individual's best interests. Yet in some studies a wish for segregation clearly arose from fears about the consequences of educational integration on the majority (Pace et al., 2010).

Lay attitudes to the sexuality of individuals with intellectual disabilities in Australia were found to be generally positive (Cuskelly & Bryde, 2004). Sexual intercourse was deemed less acceptable though once possible pregnancy and parenthood were considered (Cuskelly & Gilmore, 2007; Esterle, Sastre, & Mullet, 2008; Morales, Lopez Ramirez, Esterle, Munoz Sastre, & Mullet, 2010; Oliver, Anthony, Leimkuhl, & Skillman, 2002).

Only five studies over this period looked at lay people's beliefs about the causes of intellectual disabilities. Studies in both India and Tanzania identified a belief in 'god's will' as the most likely cause of severe intellectual disability. A significant proportion also attributed the disability to parents' actions in India, and to witchcraft in Tanzania (Kisanji, 1995; Madhavan et al., 1990). In contrast, in India only 4% of lay people saw prenatal complications or heredity as likely causes. Based on a large scale survey, Gilmore et al. (2003) concluded that the Australian public held some significant misconceptions about the causes of Down's Syndrome, despite showing reasonably accurate knowledge about the condition; 26% of their respondents believed Down's Syndrome to be caused by parental lifestyle or problems during birth. One area that has found little empirical attention to date is the link between causal beliefs, attitudes and stigma. In Ethiopia, supernatural retribution was deemed one likely cause that was in turn associated with more negative attitudes (Mulatu, 1999). In a US-based study, intellectual disability due to genetics was perceived most positively, while "self-inflicted" disability, due to drinking cleaning fluid in childhood, was viewed most negatively (Panek & Jungers, 2008).

There is a notable absence of longitudinal studies that could inform us about the effects of changes in policies and service provision on public attitudes over the study period. Only two studies made any attempt to examine attitudinal changes over time. A Canadian study concluded that there was a positive shift in attitudes from 1977 to 1991 (Rees et al., 1991). However, these results should be viewed with caution as they are based on very small cross-sectional samples. In 1991 both a group of students enrolled on a 2-year course on intellectual disability and student controls showed a shift to more positive attitudes over the 1-year study period. Tachibana and Watanabe (2004a) concluded that, over time, attitudes in Japan have become more positive, but their analyses were based on comparison with data collected 25 and 40 years earlier using different measures and samples.

Most of the studies in this section used direct attitude measures. The only study that used an indirect measure (a mock petition drive), found only a moderate correlation of 0.4 with a direct attitude measure and concluded that indirect measures may be more useful than explicit attitude measures, particularly in gauging real-life behavioural responses (Zsombok,

Hammer, & Rojahn, 1999). Several studies assessed the risk of a social desirability bias in using direct attitude measures (Beckwith & Matthews, 1994; Hall & Minnes, 1999; Henry, Keys, Jopp, & Balcazar, 1996; Horner-Johnson et al., 2002; Yazbeck, McVilly, & Parmenter, 2004). Hall and Minnes found scores on the Jackson Social Desirability Inventory (Jackson, 1974) predicted a modest 7% of the variance in scores on the Attitudes towards Disabled Persons Scale (Yuker, Block, & Campbell, 1960). All other studies found no significant correlations between measures of social desirability and attitude scales (CLAS-MR, Henry, Keys, Jopp, et al., 1996; MRAI-R, Antonak & Harth, 1994; AMRE, Antonak, Fielder, & Mulick, 1993). Thus it would seem that social desirability has at best only a modest effect on measures of attitudes towards people with intellectual disabilities, perhaps because lay people have no clear conception what socially desirable responses towards this group consist of.

3.4. *Analyses of the effects of socio-demographic characteristics and prior contact on beliefs and attitudes*

This area has attracted considerable attention in the literature reviewed. Gender, age and education have been shown in several studies to be associated with attitudes towards individuals with intellectual disabilities. Females, younger people and those with higher educational attainments tend to express more positive attitudes (Akrami, Ekehammar, Claesson, & Sonnander, 2006; Antonak et al., 1995; Burge et al., 2007; Esterle et al., 2008; MacDonald and MacIntyre, 1999; Ouimet & de Man, 1998). However, the effect of gender in particular, appears inconsistent and was not found in other studies (Hudson-Allez & Barrett, 1996; Karellou, 2003; Lau & Cheung, 1999; Nagata, 2007; Ouellette-Kuntz et al., 2010; Yazbeck et al., 2004). Scior et al. (2010) reported that most initial apparent gender differences disappeared once other socio-demographics were accounted for, which may hint at reasons for the lack of consistent findings. Finally, two studies found no correlation between age and discriminatory attitudes (Lau & Cheung, 1999; Pace et al., 2010).

One variable that has almost invariably been shown to be linked to more positive attitudes is prior contact with someone with intellectual disabilities (Antonak & Harth, 1994; Antonak et al., 1995; Beckwith and Matthews, 1994; Beh-Pajooh, 1991; Choi & Lam, 2001; Horner-Johnson et al., 2002; Lau & Cheung, 1999; Yazbeck et al., 2004). It should be stressed though that most studies that report positive effects of contact used cross-sectional designs, comparing those with and without prior contact and assuming the two groups to be similar otherwise, which is questionable at best. Studies that have directly measured the effects of contact on lay people are reviewed in Section 3.6 below.

3.5. *Cross-cultural comparisons of attitudes and beliefs*

The majority of research in this area was carried out in developed, Western countries. A few studies have examined attitudes and causal beliefs in ethnic minority communities residing in Western developed countries (Gabel, 2004) or in developing countries (Madhavan et al., 1990; Mulatu, 1999; Ojha et al., 1993), using in-depth, qualitative methodologies. Only five peer-reviewed studies examined cross-cultural differences in attitudes and beliefs at general population level over the period studied. A study that assessed attitudes in six different ethnic communities in Australia concluded that while attitudes differ between communities, the relative degree of stigma attached to different disability groups is very similar across communities, with intellectual disability among the most stigmatised categories (Westbrook et al., 1993). In a comparison of attitudes among North American and Japanese students, the latter were found to be less inclusion-friendly (Horner-Johnson et al., 2002). Korean and Korean American students were found to show similar attitudes to individuals with physical disabilities, but Koreans were more negative about people with intellectual disabilities (Choi & Lam, 2001). Asian-American students showed higher social distance from this population than African- or Latin-American students (Saeternmore et al., 2001). Among Asian-Americans in this study, those born in Asia showed higher levels of stigma than their US-born peers. Finally, white British adults were more in favour of the social inclusion of people with intellectual disabilities and were more likely to view them as similar to themselves than Hong Kong residents (Scior et al., 2010).

3.6. *Outcomes of interventions aimed at increasing the public's understanding and social acceptance of people with intellectual disabilities*

Twelve studies attempted to evaluate the outcomes of contact-based interventions at general population level, of these seven only sampled students. Nosse and Gavin (1991) examined the effects of direct contact on student volunteers and concluded that contact improves attitudes and reduces anxieties. In their study, 31 volunteers in groups of 10–12 housed and entertained individuals with intellectual disabilities and their supports over 2.5 days. Their experimental group was relatively small ($n = 31$) and potentially biased though as students opted into the contact group, rather than being randomly assigned. The effects on students of a 10-week course on intellectual disability that combined lectures with a minimum of 20 h of contact were assessed by Kobe and Mulick (1995). While they found an increase in self-rated knowledge, attitudes remained unchanged. The authors acknowledged that this might have been due to limited variability in scores and several students whose attitudes became markedly more negative over the course of the intervention.

A study by Rillotta and Nettelbeck (2007) assessed the effects of contact on secondary school pupils as part of a 3–10 session disability awareness programme. Their data was entirely collected retrospectively, and, of note, contact only accounted for 4% of the variance in attitude scores. The effects of contact on volunteers at the Special Olympics were examined by Roper, P.A. (1990) and Roper, P. (1990). He concluded that minimal, as opposed to no or ample, contact had the

strongest association with more positive attitudes and reduced social distance. He suggested that the perception of individuals with intellectual disabilities as competent may be key to attitude change. While he succeeded in recruiting 61.5% of all volunteers to the study, the effects of contact were again only assessed retrospectively. A study of neighbours' views of residential facilities for people with intellectual disabilities found that visiting the facility did not have a positive effect on attitudes by itself, but only in interaction with other factors, such that positive effects were observed, for example, on neighbours who had young children and visited the facility (Schwartz & Rabinovitz, 2001). As in most other studies reviewed, the design was cross-sectional, and as Rillotta and Nettelbeck (2007) and Roper, P.A. (1990) and Roper, P. (1990), no baseline data was collected in trying to evaluate the outcomes of an intervention.

It has been suggested that contact may have its positive effect on attitudes by reducing anxieties and fears lay people may have about interacting with individuals with intellectual disabilities (Beh-Pajooh, 1991; Hudson-Allez & Barrett, 1996), but that this may take time. A note of caution about the effect of contact has been sounded by the finding that it is *positive* contact that may lead to a greater willingness for social contact (Hall & Minnes, 1999), whereas negative contact experiences, especially in childhood, may in fact increase social distance (Narukawa, Maekawa, & Umetani, 2005; Tachibana, 2005).

Of note, most studies that have evaluated such interventions base their conclusions on small, unrepresentative samples. Studies that have directly measured the effects of an intervention, either based on providing contact with individuals with intellectual disabilities, and/or through education, are few and mostly rather poorly designed. Most used cross-sectional designs, arriving at their conclusions typically by comparing those with prior contact to those without, or by retrospectively comparing those who completed an education/contact based programme to controls. This ignores confounding factors, most notably that individuals with more positive attitudes are more likely to seek contact or enter an educational programme in the first place.

Well designed evaluations using a pre- and post-design *and* representative general population sample, rather than student samples, were not identified during the study period. Only five studies used a repeated measures design (Hudson-Allez & Barrett, 1996; Kobe & Mulick, 1995; MacDonald & MacIntyre, 1999; Nosse & Gavin, 1991; Ojha et al., 1993), but only two used non-student samples. The most rigorous of these studies targeted all neighbours within the micro-neighbourhood of nine new homes, interviewed them at three time points, and had a high response rate (78%), but the authors acknowledged that the information provided to neighbours may not be representative of other areas (Hudson-Allez & Barrett, 1996).

4. Discussion

This systematic review identified 75 peer reviewed studies regarding knowledge, attitudes and beliefs about intellectual disability among the general public of working age. The majority of the evidence reviewed (66 of the 75 articles) consisted of descriptive studies of attitudes among lay people and students using direct attitude measures. These identified a number of socio-demographic factors that appear to predict attitudes, namely age, educational attainment and prior contact with someone with an intellectual disability. While in highly developed societies most lay people seem to broadly agree with the *right* of people with intellectual disabilities to be included in society, the latter continue to be viewed as highly undesirable partners for social interactions.

There is a surprising lack of evidence about possible changes in attitudes across time. While attitudes differ across cultures, there seems to be little variation in the relative degree of stigma associated with intellectual disability. Lay people want greater social distance from people with intellectual disabilities than those with physical disabilities, but individuals with severe mental health problems appear to be even more stigmatised. Of note, social desirability appears to be only weakly correlated, if at all, with attitudes, as measured on direct scales. A few of the studies reviewed suggest that lay people's reluctance to interact with people with intellectual disabilities may be due, at least partly, to discomfort and anxiety. If this finding were confirmed, it suggests that, in line with Pettigrew and Tropp (2006), reducing anxiety concerning interactions with individuals with intellectual disabilities should be a key target.

Researchers have examined the effects of label changes on attitudes, but the question how well lay people understand different labels has largely remained unanswered. Only eight studies explicitly examined public knowledge about intellectual disability. They suggest that the public generally has a limited understanding of the concept of 'intellectual disability', is confused about different terminology used and that awareness varies considerably across cultures, but is generally low. These conclusions should be treated with caution though as they are based on a small number of studies that used unrepresentative samples. To date there is little solid evidence whether a positive relationship exists between awareness of intellectual disabilities and stigma, although it has been suggested that reducing misconceptions and emphasising the capabilities of people with intellectual disabilities can lead to improvements in attitudes.

Research into the public's causal beliefs about intellectual disability and their effects on stigma is limited to date. Only five studies examined lay people's causal attributions; of these only two considered the link with stigma. A study by Mulatu (1999) is the most informative of these studies, as he compared causal beliefs about nine different health conditions and evaluated the relationship between such beliefs and stigma. The sample was a convenience sample though and the numbers responding to each condition were small ($n = 50$). A much better understanding is needed in this area, not least as research in the area of mental health suggests such an understanding can not only highlight targets for public awareness campaigns, but also what messages to avoid (Angermeyer & Matschinger, 2005; Corrigan et al., 2000; Jorm & Griffiths, 2008).

The current review suggests a dearth of evaluations of efforts aimed at tackling low awareness and negative attitudes at general population level. While contact has consistently been shown to be associated with more positive attitudes, high

quality evaluations of contact-based interventions with lay people of working age could not be identified. The main route commonly employed to tackling negative attitudes to people with intellectual disabilities is through interventions within schools aimed at providing (positive) contact experiences between typically functioning children and peers with disabilities and through inclusive education generally. Admittedly, interventions targeting adults in the general population lack a comparable ready made environment. Of the twelve studies that evaluated such interventions, most relied on retrospective data and small samples, and participants mostly opted into the programme, rendering the findings very biased. Only two studies evaluated an intervention using non-student samples and a repeated measures design (Hudson-Allez & Barrett, 1996; Ojha et al., 1993). The limited conclusions that can be drawn from this body of research indicate that interventions may have their effects not by themselves, but through an interaction between intervention and respondent factors. Further, it is important to control the quality of contact, as *positive* contact seems to reduce social distance, yet negative contact experiences may have the opposite effect. In designing future evaluations, researchers should bear in mind that only studies that use repeated measures designs and, ideally, randomly assign participants to groups can provide reliable evidence about the effects of contact. Furthermore, a dichotomous view of contact as either absent or present is likely to mask complex aspects of contact that may influence its impact, such as whether contact occurred on a voluntary basis, its frequency and the perceived quality of the relationship or contact experience (Alexander & Link, 2003).

The research reviewed has a number of other important methodological limitations. As noted, the evidence is dominated by attitude surveys using (mostly local) convenience samples and 43% of the literature reviewed is based on student samples, rendering the findings unrepresentative. The only attitude surveys to use large stratified random samples still have marked limitations. Two collected data via telephone, which arguably increases the risk of socially desirable responses (Burge et al., 2007; Ouellette-Kuntz et al., 2010). The third study presented an analysis of secondary data and acknowledged a number of selection biases (Pace et al., 2010). While there is evidence to support the notion that explicit attitudes predict future behaviour, this relationship is strongest with non-student samples, and where self-report measures of behaviour are used (Kraus, 1995), factors that were not addressed in most of the studies reviewed. Furthermore, responses were mostly measured to a hypothetical individual, while responses to individuals with whom the respondent has had naturalistic contact were less frequently assessed. Other than the general tenets of intergroup contact theory (Allport, 1954; Pettigrew, 1998), very little of the research reviewed tested any theoretical model. In studying attitudes, researchers on some occasions included social distance and comfort as measures of external stigma. None considered the results, for example, in relation to stigma theory, which seems a marked omission.

Future research should go beyond descriptive accounts of public attitudes and beliefs. There is a need for research that considers the complex processes involved in the formation of stigma, prejudices and discrimination that can negatively affect the opportunities available to people with intellectual disabilities and their social inclusion. Studies in the mental health field indicate that a more comprehensive understanding of the stigma process needs to consider not only lay people's attitudes, but also their emotional responses, causal attributions and familiarity with the respective condition. As yet, intellectual disability research has not tested the relationship between different variables implicated in stigmatisation. Nor has an attempt been made to link findings to the potential functions of stigma, which is likely to highlight some complex and important issues.

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