YOUNG CHILDREN'S UNDERSTANDING OF DISABILITIES: THE INFLUENCE OF DEVELOPMENT, CONTEXT AND COGNITION[1]

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Short title version: Children's understanding of disabilities

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[1] A version of this paper was presented at the BPS Education Section, Exeter 1998 and the European Congress of Psychology, Rome 1999. We are grateful to Pam Maras for detailed and constructive criticisms of an earlier version of this manuscript.

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ABSTRACT

Throughout Europe, educational support for children with disabilities has moved towards a model of inclusive education. Such policy changes mean that for all children there will be an increased likelihood of working with and encountering children with differing disabilities and difficulties. Previous research had indicated that children had poorly differentiated views of developmental differences. The present study investigated children's representations of different disabilities. Seventy-nine 8-9 and 10-11 year old Greek children from an urban school and a rural school completed an attitudes toward school inclusion rating scale and a semi-structured interview. Responses to the attitude scale provided generally positive views of educational inclusion. However, children were less positive about activities that might directly reflect upon themselves. Children's responses in the interviews indicated that they were developing rich representations of differences and diversities. Children had the greatest understanding of sensory and physical disabilities, followed by learning disabilities. There was limited knowledge of dyslexia and hyperactivity and no child was familiar with the term autism. Both groups of children identified a range of developmental difficulties, with older children being more aware of specific learning disabilities, their origin and impact. Results are discussed in terms of children's developing knowledge systems and the implications for educational practices.

INTRODUCTION

Major changes in educational philosophy and legislation have led to increased numbers of children with various disabilities being educated in the mainstream classes or in special units with varying degrees of integration (Croll and Moses, 1998). Although in certain areas there is still debate about the appropriateness of full inclusion and the practices of implementation (see Lindsay and Thompson, 1997), the reality is that many children with difficulties and disabilities are working and interacting with mainstream peers on a daily basis. Ideological issues, organizational concerns and training needs of staff have been addressed in detail. Yet, few studies investigate how typical mainstream peers interpret and understand the range of specific disabilities that exist. This is a marked omission from both a theoretical and practical perspective. The present study aims to address this gap by considering typical children's understandings of different disabilities.

Increased inclusion has the direct effect of increasing contact between children with disabilities and their mainstream peers. Peers will provide a different and powerful environment that impacts on the behaviour and perceptions of children with specific difficulties. Yet to date it is not clear what factors govern the perceptions and behaviour of mainstream children nor what inferences they draw about the impact of experiencing particular disabilities. Typically developing children's representations of the various disabilities are likely to contribute to both their understanding and interpretation of the behaviour of their non-typical peers (Lewellyn & Hogan, 2000 for a discussion of the impact of models of disability and the importance of developmental models).

From a theoretical perspective, studies of a wide range of phenomena have led to the development of models which acknowledge both the role of the child's naïve theories and the experiences they receive in the construction of their understandings (see Buchanan-Barrow and Barrett, 1998, in relation to schools; Hatano and Inagaki, 1997, in relation to intuitive biology; Kalish, 1998, in relation to illness, Zimmerman and Levy, 2000 in relation to race schema).

Constructs that span social, psychological and biological factors, raise particular issues about the role of social cognitive factors in the children's understandings and behaviours. When we consider specific difficulties it is currently unclear the extent that children generalise from one disability to another. Nor is it clear whether children's understandings are constrained by their own explanations of the causes of the disability. These are important issues to address as "*knowledge and awareness regarding disability issues have been characterized as key features in changing negative peer attitude towards disabled children*" (Shapiro and Margolis, 1988). In a similar vein, Lewis and Lewis (1988) have emphasized the importance of information and knowledge of disability issues by mainstream peers (see also Maras and Brown, 1996).

In what ways are children's understandings important?

While in no way assuming that understanding is sufficient to change attitudes and behavior, understanding plays an important role in underpinning subsequent belief structures and patterns of behavior. Investigations of children's common sense concepts enable us to identify developmental changes and recognize important differences and commonalties between situations. Children's understandings of a range of phenomena differ to adults' (Carey, 1985) and understanding of these domains influences the ways in which children interpret new information. Further, children may interpret such domains differently if they are highly relevant to them. Thus, profiling a child's knowledge base, examining developmental differences and identifying the salience of the concepts in a child's life are important elements in understanding behaviour and designing appropriate curricula.

A few studies have considered specific subgroups of specific disabilities. For example, Lewis (1993; 1995) has examined children's understandings of severe learning difficulties, Gash and Coffey (1995) have considered moderate learning difficulties, Maras and Brown (1996) have examined hearing impairment, learning and physical disabilities and Diamond, Heatenes, Carpenter and Innes (1997) have addressed preschoolers' knowledge of physical disability, hearing impairments and visual impairments. Many of these studies have been carried out in a context where particular patterns of integration have been attempted (e.g. different forms of school contact, Maras and Brown, 2000) or for specific types of need (e.g. severe learning difficulties, Lewis, 1993). However, these approaches generally rely on the researchers' preconceptions of the issues. That is, researchers have chosen the stimuli for assessment that relate to earlier categorical/medical approaches to special education (e.g. prototypical cases such as physical disabilities) or they have identified a priori relevant domains to be addressed. Children's own perceptions of differences and diversities have not been addressed. The general conclusion from the work to date is that the concept of disability appears to be poorly differentiated in children throughout the primary school years, even for children that have been involved in structured interactions with children with different disabilities or impairments (Maras and Brown, 1996). There is evidence that older children tend to produce richer and more detailed information and possess a more sophisticated and advanced understanding of disabilities. These changes are thought to result from both conceptual change and different social experiences (Hazzard, 1983; Lewis, 1993). None of these studies considers the breadth of children's understandings of specific difficulties or the impact that these difficulties are believed to have on the other children's lives.

Conclusions from the studies that focus on disabilities are in marked contrast to the research demonstrating that young children have detailed, if often incomplete, knowledge of a wide range of other topics e.g. biological inheritance (Johnson and Solomon, 1997), diet (Turner, 1997) and germs and viruses (Sigelman, Alfred-Liro, Lewin, Derenowski and Woods, 1997). Of particular relevance to the present issue is Diamond et al.'s (1997) study with preschoolers. Their data indicated that the children's knowledge of the three disabilities assessed contributed independently to explaining the variance in social acceptance. However, the specific questions tapped very basic knowledge and were unrelated to the children's experiences of inclusive practices. The present study extends these studies by considering children's own descriptions and explanations of specific disabilities in relation to their own experiences.

What factors might influence children's understandings?

Current research highlights a number of additional variables that need to be considered in children's developing understandings. In the first instance, age differences are critical. Developmental changes in children's attitudes and knowledge have been systematically reported in the previous studies (i.e. Hazzard, 1983; Lewis, 1993). The wider social context in which children find themselves has also been raised as an important factor. There is preliminary evidence to suggest that children in rural communities have more positive dispositions towards the disabled than their urban peers (Gash and Coffey, 1995). Although the explanation of this difference is unclear, there are suggestions that rural children have more opportunities for closer interactions and discussions compared to their more "alienated" urban peers. This raises the question about the role of contact and personal experience. Evidence suggests that lack of contact with children who experience specific disabilities results in negative attitudes and unrealistic expectations (Gash and Coffey, 1995). Although the research findings are still ambiguous and contradictory, experience of and increased contact with people with disabilities appears to increase children's understandings.

The current study

Children's understandings can be influenced both implicitly by experience and explicitly by teaching practices. To minimise the effect of explicit information we chose to investigate the views of children where no explicit interventions were in place and inclusion was not a high educational priority yet a clear understanding of the cultural dimensions was held by the researchers. Thus the data for the present study were collected in Greece where both the first and third author had worked. A number of factors supported this choice. Firstly, a large-scale questionnaire study in Greece had indicated that "*most people including teachers had limited awareness of special needs*" (Sakadami-Aggelopoulou et al., 1994). However, the questionnaire was restricted, inviting individuals simply to tick boxes about different disabilities. Nonetheless Greek pupils in units were generally positive about their experiences and more positive relatively to British and New Zealand populations (Sakadami-Aggelopoulou et al., 1994; Wade et al., 1995). Finally, the investigation was carried out in Greece because of socio-cultural factors (Perret-Clermont, 1980; Resnick, Saljo, Pontecorvo, and Burge, 1997). Greece is currently changing from a traditionally agricultural society to an industrialized European Community member. The extended family structure has also been altered and Greek children nowadays grow up in increasingly competitive environments. These political, economic and social changes have emphasized the need for advanced educational and professional services for children and adults (Nikolopoulou, 1986). The Bureau for Special Education was first established by the Greek Ministry of Education in 1972 and Greece is now in the early stages of developing inclusive education. A number of children with various kinds of special needs are already integrated into mainstream schools, although neither teachers nor parents or peers are appropriately educated towards educational and social integration (Petridou et al. 1990). This factor would allow us to tap initial developments of children's understandings, reflecting their own knowledge and the society's representations of disability.

To reduce the likelihood of narrowing the children's responses the present research was framed within the context of diversity and the 'general differences' that exist between different children. Pilot work had demonstrated that it was possible to tap the children's understandings in an unconstrained fashion. Children provided spontaneous descriptions and explanations of various disabilities within the context of discussing diversity. The main focus of this study was to investigate the breadth, nature, variability and accuracy of these understandings. Information on the children's stated experiences of people with disabilities and their reported attitudes towards their disabled peers was also collected in order to address the association between understanding, attitudes and personal experience, while two age groups from both a rural and an urban environment were included to examine possible developmental and social influences. Thus, within the broader remit of mapping children's understanding of difficulties and disabilities, we also aimed to consider the ways in which children's understandings might differ across a number of different dimensions.

METHOD

Participants

The initial sample consisted of eighty-three children drawn from the mainstream state sector. The sample was balanced for age and gender. Forty-two children were recruited from the third grade (two grades following entry to primary school; mean age 8;6, range 8;0 to 9;0 years) and fifth grade (one grade before transition to secondary school; mean age 10;6, range 10;0 to 11;0 years,) of an urban school. Forty-one children were recruited from the third and fifth grade (mean age 8;6, range 8;0 to 9;0 and 10;6, range 10;0 to 11;0 respectively) of a rural school (see Table 1). Each grade had three classrooms. One class from each grade of each school was randomly selected and all children from that classroom were interviewed for the study. Four children were lost from the study due to audio recording problems. No child who had repeated a school year was included in the sample. The rural school included a support class for children with minor difficulties in reading and mathematics. These children were *not* diagnosed as dyslexic, learning disabled or in any other formal way. Both schools were public, mainstream and in middle-class socio-economic areas, chosen to reflect a typical intake of the local community. There is no reason to assume that the populations they were drawn from were significantly different in terms of socio-economic or educational status. Julie, I will try to get something for this, will look in the Internet this week.

INSERT TABLE 1 ABOUT HERE

rocedure

Children were seen individually in an empty classroom in their school and were informed that the purpose of the interview was to find out what children of their age think about the differences between children. The session began with three open-ended questions, continued with disability-specific questions and ended with the attitude rating scale and the experience questionnaire. This was done to assure that children were introduced gradually to the topic and that their responses were not governed by the investigators' priorities. Although it could be argued that this sequence may have consequently influenced the children in their attitude ratings, it was considered important that their spontaneous comments were not influenced by the specific questions used in the rating scales. The interviewer initially invited the children to reflect on the ways in which children can be different from one another. If the children did not spontaneously refer to difficulties and disabilities as a difference, they were then told that "another difference is that some children may have 'special needs[3] and some do not" and they were asked to "talk about all the different 'special needs' they could think of". The interview continued with the specific questions. Interviews lasted 15 minutes on average (range 10-25 minutes) and were tape-recorded and subsequently transcribed by two native Greek speakers (the first and third authors).

Instruments

Experience of differences and disabilities

In order to assess each child's experience, Section 3 of the Test of Attitudes towards children with disabilities (Anne Feerick, as cited in Gash, 1993) was used. This is a 3-item questionnaire in which the child is asked a) to indicate whether or not he/she knows someone who has 'special needs', b) whether or not there are any children with 'special needs' in their school and c) and whether or not they have any children with 'special needs' in their own class. Following piloting, two more items were added to the questionnaire. These included: d) a question in which children were asked to rate on a four-point scale the frequency with which they have ever seen people with 'special needs' and e) a question which asked the children to indicate whether or not they had any friends, relatives or family members who had 'special needs'. Thus, the resulting questionnaire had five items that were scored independently.

Attitudes towards school inclusion

In order to assess children's attitudes towards school integration of children with differences and disabilities, a 5-item rating scale was developed. Children were asked to rate on a five-point Likert-type scale (where points were represented by a smile face scale) whether they would like:

1. A child with 'special needs' to be in their school
2. A child with 'special needs' to be in their class
3. To sit next to a child with 'special needs' in the classroom

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[3] We used the terminology that the children would commonly use. The translation of 'eidikes anagkes" is special needs. Single quotations mark that the appropriate Greek term was used.

4. To play with a child with 'special needs' during lunch time and
5. To do a school project with a child with 'special needs'.

Interview

The interview schedule was constructed through an iterative process. In order to identify the different types of disabilities to be included in the structured interview, 20 postgraduate Child Psychology students were asked "to identify five types of disabilities they would include in an interview, if they were to examine children's knowledge of specific disabilities". From this list, types of disabilities were selected according to preference order and domain of development to which they referred. The specific disabilities selected and included in the interview are the following:

a. *Deafness* and *Blindness*, representing sensory disabilities,
b. *Physical disability*
c. *Mental retardation*, representing cognitive disabilities,
d. *Hyperactivity* and *Autism*, representing more complex disorders described in the DSM-IV and currently popular in the media, and
e. *Dyslexia*, reflecting specific learning disabilities.

Specific terms were chosen were identified from pilot interviews to be familiar to the children and culturally appropriate for the sample investigated. Thus, some of the terms may not be the conventional terms currently used by professionals. The interview consisted of two parts. The first part elicited the children's general and spontaneous understandings of diversity and differences, while the second part required children to respond to set questions about particular specific disabilities and their impact. The interview questions are presented in Appendix A.

Coding System of the interviews

Each interview question was coded separately. Codes were derived in two ways. Firstly, from theoretically self-contained themes related to children's general understanding of development such as their understanding of the specific nature of the disability in question and their understanding of the educational, social, and emotional implications of having a particular disability. Key examples of these are presented in Table 2. Secondly codes were identified from a preliminary analysis of 16 randomly selected interviews. These interviews were transcribed; their key themes were extracted, examined for common themes and then organized into categories. Each category was assigned a code and each code applied to each group of words with a distinct meaning. Categories were mutually exclusive. Statements where allocation to a category was ambiguous were discussed between the researchers and a shared decision on their categorization was reached. Repeated statements were coded as one unit of information (i.e. "*can't see*, *can't see* the flowers, *can't see* other people"), but different statements in the same category were coded separately and were regarded as two different pieces of information (i.e. "*can't walk*, *can't move his feet or hands*"). Thus, each child could have produced more than one response for each of the specific questions. Twelve interviews were randomly selected and coded by the first and third authors to confirm inter-coder reliability. Cohen's Kappa reliability correlation ranged from .72 to .94 with a mean of .82.

INSERT TABLE 2 ABOUT HERE

RESULTS

In this section, the results from the attitudes and experience structured questionnaires are presented first. Following this, the data from the semi-structured interviews on children's understandings is described. Each code for each disability question was represented in SPSS as a separate variable and children's responses were coded as dichotomous nominal data (i.e. if the child referred to a particular category or not). A separate variable for each disability question included the number of responses each child gave to each question. For example ability to see was one variable for blindness but children could have mentioned other factors as well. These set of variables were summed. All the data were analysed using non-parametric procedures; Mann-Whitney tests were performed to investigate whether children differed in the amount of information they provided for each different question, while separate chi-square analyses were performed to examine the effects of age, gender, personal experience, and social setting on children's specific understandings.

Experiences of differences and disabilities

Most children had at least some basic experience of people with disabilities. The vast majority of the sample (65 children, 82.3%) reported having *seen* people with various disabilities sometimes or often, while 10 children (12.7%) reported encountering people with disabilities only once or twice. Only four children (5.1%) have never encountered people with disabilities before. The majority of the children (63.3%) directly or indirectly *knew* people with disabilities. Amongst those who did, most reported knowing neighbors, relatives or friends with some kind of physical or cognitive disability: 5 people who were blind; 3 deaf; and 1 deaf-mute. In addition, broader groups were mentioned: 3 people with speech difficulties; 2 orphan children; 2 chronic illnesses (cancer, asthma); 1 said she knew "someone who had been raped" and finally 1 reported knowing about Helen Keller. Thirty-three children (42%) reported having personal experience of disabled family members, relatives or friends: 14 with a physical disability; 10 with learning disabilities; 4 with visual impairments; 2 with chronic illnesses; 1 with 2 deaf-mute relatives; 1 with speech difficulties; 1 with a hearing impairment; and 1 child mentioned having a close friend "who is emigrated from Albania". Thus, the children had different degrees of contact with individuals with differences and disabilities construed the concept of 'special needs' broadly.

Separate 2*2 chi-square analyses of the effects of age, gender and place of residence on children's reported experience of people with "special needs" showed no statistical differences between the respective groups (all p>.05). **ILIANA WE SHOULD REPORT THE Chi squares**

Attitudes towards school integration

Children's responses to the attitude questionnaire ranged from strongly disagree to strongly agree (range 1 to 5). The means and standard deviations were separately calculated for each question and are presented in Table 3.

INSERT TABLE 3 ABOUT HERE

As can be seen from the table, most children had positive attitudes towards having children with 'special needs' in their school, in their classroom, sitting next to them, doing schoolwork and playing with them during the school break. The pattern of responses varied across the questions. No significant differences were found in responses to "like to be in the same school with" and "like to do homework with". However, both of these situations were rated significantly more positively that "sitting next to" ($z=4.18$, $p<0.001$ and $z=3.91$, $p<0.001$ respectively), "playing with" ($z=-2.49$, $p<0.05$ and $z=-2.52$, $p<0.05$ respectively); and "having a 'special needs' child in the same class" ($z=-2.71$, $p<0.01$ and $z=-2.96$, $p<0.005$ respectively). These results cannot be explained simply by proximity but they may reflect and identification process. Success that 'homework with' may be seen as helping whereas being in the same class might reflect an identification with. These possibilities are considered further in the discussion.

Significantly more children from the urban school were positively disposed towards playing with a child with 'special needs' during break time ($z=-2.87$, $p<.01$) compared to their rural counterparts. No other significant age, gender, location or personal experience differences were found in children's expressed attitudes. **AGAIN STATS**

Open-ended Interview Questions

Views of Diversity

Children had rich and differentiated views of diversity. In response to the open-ended question about the different ways in which children are different from one another, fifty-two per cent of the children mentioned three or more differences. These included biological differences (52%, personality/ individual (36.7%), social/ familial (26.6%) and educational (35.4%) differences. Twenty-four per cent spontaneously mentioned 'special needs' as a difference between children, while eight per cent mentioned social differences and needs, i.e. being poor or orphan. . Examples of responses to this question based on their coding can be found in Table 4. Thus for 25% of the children in this sample 'special needs' was a differentiating factor between children.

INSERT TABLE 4 ABOUT HERE

Rural children produced more differences than their urban peers (z=-3.87, p<.001) and younger children referred more to biological/ physical differences than older children ($X^2(1)=3.71$, p<.05). Direct or indirect experience of people with disabilities also had a significant effect on children's responses to this question. Significantly more children who reported knowing someone with "special needs" spontaneously made specific references to 'special needs' as a difference between children compared to the non-experienced children ($X^2(1)=4.7$, p<.05). The wide range of differences noted by the children demonstrates that they already possess differentiated understandings that are influenced by their own experiences and complements the data collected in the structured questionnaire. However, such responses do not tell us about the nature of the children's understandings and whether these are differentially affected by age and personal experience.

Knowledge and differentiation of difficulties and disabilities

A range of different 'special needs' were identified when children were provided with an non-directive open-ended question - *"Tell me all the different 'special needs' you can think of"*. Seventy-five per cent of children identified physical problems as a disability (i.e. "*can't walk", "doesn't have legs/ arms*"), 56% sensory disabilities (i.e. "*mute-can't speak", "blind-can't see", "deaf-can't hear*"), 44% social difficulties (i.e. "*orphan", "poor*"), 28% chronic illnesses (i.e. "*cancer", "asthma*"), 18% cognitive/ mental difficulties (i.e. "*children who have problems with their brain*", "*they can't think/ understand properly*") and 11% educational difficulties (i.e. "*they have problems with writing", "they have speech/ reading difficulties*"). There was a trend for more children to identify disabilities that have clear physical manifestations. This is true for all the children independent of their age, gender, location or experience. Thus providing a simple list does not appear to be related to developmental factors. However, a general question may fail to capture more detailed aspects of children's understandings.

Disability-Specific Questions

Children's understandings across the different disabilities

The second part of the interview consisted of specific questions about particular difficulties and disabilities, their impact and causes. Figure 1 shows the percentage of children who were able to give at least one appropriate response about the nature of each disability and the percentage of children who were able to identify at least one appropriate causal attribution.

INSERT FIGURE 1 ABOUT HERE

As the figure demonstrates, both responses to questions about the nature of the disability and the ability to identify a relevant causal attribution follow a similar trend. Moreover, the trend is similar to the children's responses to the open-ended question presented above. Those problems with clear physical manifestations, which differentiate children from the typical peers, produced more detailed responses. Moreover, when the categories 'mental retardation', dyslexia, hyperactivity, and autism are considered separately the majority of children are unable to provide any details. Older children provided significantly more information for cognitive difficulties ("mental retardation") ($z=-2.19$, $p<.05$) but there were no other age, gender, experience or location differences.

Children's understandings of the causes of different disabilities

Amongst the most frequently identified disabilities, most children attributed causes to *birth* or *accident*. Whenever birth causal attributions were mentioned, they were more likely to be of a general nature (i.e. "*these children were born this way*" or "*God made these children this way*"). In contrast, when accident causes were mentioned, children produced general (i.e. "*they had an accident*") as well as specific causal attributions (i.e. "*spinal column injuries*" for physical disabilities*, "eyes burn at a fire*" for blindness etc.). Table 5 shows the number of children attributing causality to birth, accident or both for each of the questioned disabilities.

INSERT TABLE 5 ABOUT HERE

Separate two by two chi-square analyses were performed to investigate the extent to which children's observed causal attributions (birth or accidental) differed for each disability. Thus, it was possible to ascertain whether each particular developmental disability was associated with a particular cause. Significantly more children attributed deafness ($X^2(1) = 5.58$, $p<.05$), blindness and physical disability to accidental causes ($X^2(1)=23.4$, $p<.001$ and $X^2(1)=19.25$, $p<.001$ respectively) . Examples for causes of blindness included "*they burned their eyes in a fire*", "*they were always sitting too close to the TV and their eyes got hurt*", while children mentioned "*car accidents*", "*spinal column injuries*" or "*accidents on the beach*" as possible causes for physical disabilities. The opposite trend was evident for dyslexia, where birth causes ("*they were born this way*") were more common ($X^2(1)=7.36$, $p<.01$). A similar trend was also apparent for "mental disability", with more children referring to birth causes, although this difference did not reach statistical significance (X^2 (1)=3.52, $p=.06$) .

Older children mentioned birth causes for deafness significantly more than their younger peers ($X^2(1)= 6.7$, $p<.01$) and more children from the urban area referred to birth causes for deafness, while more rural children referred to accidental causes of physical disabilities ($X^2(1)=4.56$, $p<.05$ and $X^2(1)=7.04$, $p<.01$ respectively). No other developmental, gender, experience or location differences were found in children's causal attributions of the different disabilities.

Children's understandings of the impact of different disabilities

When the ways in which the children in the sample understand different difficulties and disabilities to impact on the child's life are considered it can be seen that the children are again able to differentiate across type of disability. Children were asked to reflect on the impact of each different 'special need' addressed. Categories were developed which referred to the physical, social, cognitive, educational, communicational and emotional impact of all the different disabilities. Examples of the children's references to each of the categories are given in Table 6.

INSERT TABLE 6 ABOUT HERE

Table 7 summarizes children's responses for each category by age group. There was an overall match between the problem identified and the impact of the difficulty. The main impact of physical disability was reported to be restraints of movement. The main impact of hearing difficulties was described as communication, while visual disabilities were considered to have an educational impact (in terms of reading and writing). Learning difficulties were associated with a cognitive impact. Few attributions were made for dyslexia but, when they did occur, they were related to an impact in communication. More general impacts were also reported. For all the disabilities questioned, social or emotional impacts were frequently included in the children's responses.

INSERT TABLE 7 ABOUT HERE

Separate 2*2 chi-square analyses were performed for each of the coding categories to examine whether children's understandings of the implications of each of the disabilities differed across age, gender, experience or location. Age significantly affected children's responses. None of the children from the younger age group referred to emotional implications of deafness whereas over 20% of the older children did ($X^2(1)=9.41$, Fisher's exact $p<.01$). More older children discussed the social and emotional impact of having a physical disability ($X^2(1)=3.86$, $p<.05$ and $X^2(1)=5.6$, $p<.01$ respectively). Older children also made more references to cognitive implications of having a cognitive disability ($X^2(1)=6.99$, $p<.01$) and to communication (speech) implications of being dyslexic ($X^2(1)=6.96$, $p<.01$) than the younger age group. Also, school location appeared to have a small effect on some of the children's responses, as more rural children discussed the social implications of physical disabilities ($X^2(1)=6.69$, $p<.01$) compared to the urban children. There were no gender effects on children's responses, except for deafness, where 20% of the girls referred to the emotional impact of deafness, compared to none of the boys ($X^2(1)=9.4$, Fisher's exact $p<.01$). No effects of experience of people with disabilities were found on children's understandings of the implications of different disabilities, except for cognitive disabilities, where more experienced children referred to the impact of having a cognitive disability on communication than the non-experienced ones ($X^2(1)=3.68$, $p<.05$).

Children's misunderstandings of disabilities, their impact and causes

As expected, not *all* children were able to show appropriate understanding of different disabilities and difficulties. Inevitably, some provided no responses to particular questions ("*I don't know*"), while others gave inappropriate and irrelevant responses, reflecting their lack of understanding of the issues relevant to the disability questioned. Tables 8 and 9 present the number of children who did not respond or responded inappropriately to each of the disability-specific questions on impact and causes and provides some examples of the children's misunderstandings.

INSERT TABLES 8 AND 9 ABOUT HERE

DISCUSSION

Children's attitudes

In this study children's views about disabilities were addressed in two different ways: by means of a structured rating scale and an open-ended interview. The results of the attitude rating scale produced limited information. The majority of the children in our sample expressed positive attitudes towards their non-typical peers and this skew in the results limited analysis of the relationship between attitudes and children's developing understandings of disabilities. The results of the open-ended interviews illustrated that simple conclusions from these ratings was not straightforward. Children provided broad views of the disabilities described and held incomplete and in some cases erroneous understandings. Thus it is not clear that the children shared similar understandings of the terms when they completed the rating scales. Nikolaraizi and De Reybekiel (2001), in a study investigating UK and Greek children's attitudes towards their deaf, blind and physically disabled peers, have suggested that typically developing children may hold positive attitudes at a somewhat superficial level, mainly expressing social concern and willingness to help, but not necessarily a willingness to interact with their disabled peers and this interpretation could also account for our findings. Nonetheless, children from rural and urban schools differed in their responses. The relatively higher educational competition across the children in urban areas, where academic excellence in school performance is more highly valued, may account for this difference (Georgas, 1990). If urban children are more competitive about their school performance they may be less willing to share class time with a child who is experiencing difficulties but may feel more able to express positive attitudes in relation to activities outside the classroom.

Children's understandings of disabilities and their impact

Contrary to research that suggests that children have undifferentiated views of disabilities, the present study presents a more complex picture as evidenced by their responses. Children have emerging views of diversity and at least a rudimentary understanding of the potential difficulties and their impact on the children's lives. There was greatest awareness of those disabilities that are evident through a physical indicator such as a hearing aid or physical disability, thus forming a discrete category ("physical disabilities"). In contrast those disabilities that lie on a continuum such as hyperactivity and dyslexia ("psychological" disabilities) where less well known. These external markers in the world map onto the processes involved in concept development. Categories that have clear discrete boundaries (in our study, "physical disabilities) are developed more quickly and efficiently than those with fuzzy boundaries ("psychological disabilities) (Braisby & Dockrell, 1999). Thus, for the children there is a match between the context in which they encounter disabilities, the marker of the disability, and the ways in which concepts are developed. Our analysis further suggests that the children have a core of accurate knowledge in that they "matched" the problem with a specific behavioral implication. Interestingly, they also "matched" the different disabilities with a specific cause, as they attributed perceptually salient and externally visible disabilities (i.e. blindness and physical disabilities) to "accidental" –external-causes and more abstract and less salient difficulties (i.e. cognitive disabilities, dyslexia) to "birth" –internal- causes. The core knowledge appears to be structured around the most relevant and obvious characteristics of the disabilities questioned. The children's awareness of other aspects or causes of these disabilities was comparatively limited and general. Misunderstandings were evident both in children's irrelevant responses, as well as in their stereotypic misconceptions of the social and emotional implications of a disability. For example, the following statements were made: "*Deaf children do not know what time it is", "Blind children always stay in bed", " physically disabled children are homeless", "learning disabled children will be short", "dyslexic children only have break time in their mind*". In addition, picturing non-typical peers as unhappy, lonely, without friends, unable to play or be part of society were very common attributions. Some children went even further to foretell disabled children's future in particularly negative prospects, mentioning that "*they wouldn't be able to find a job, or to get married and have children*" and that "*they would live an unhappy life*". Hazzard (1983) has discussed the creation of a "helpless" social stereotype of the disabled and some of the children's expressed views in our study seem to confirm the development of such a view. Gaps and over-simplistic generalizations were also evident in children's understandings, particularly in the more abstract problems addressed, namely cognitive disabilities, hyperactivity, autism and dyslexia. Few children were aware of these problems and when they were their knowledge appeared limited. Prevalence data suggested that these are the more common problems both in terms of their representation in the media and occurrence in mainstream classrooms and thus raise practical questions about appropriate preparatory elements of inclusive education.

Children's expressed understandings of the different disabilities across the "disability-specific" questions appeared to be "*highly scalable*" (Conant and Buddoff, 1983), with autism being the least known, followed by hyperactivity and dyslexia. Understanding of cognitive and learning disabilities was limited, particularly for the younger children. In contrast, most of the children in our sample, with very few exceptions, were in a position to exhibit some basic and generally accurate knowledge of sensory and physical disabilities. A similar pattern was revealed when children were asked to talk about the causes of these disabilities, where sensory and physical disabilities were attributed to accidents and cognitive disabilities to birth.

These findings provide some evidence in favor of a constructivistic interpretation of young children's knowledge of disabilities and of a gradual conceptual change in their understandings. Children tended to understand more about noticeable and perceptually salient disabilities even though these are less prevalent (Dockrell and Messer, 1999); these disabilities are more visible not only because there are salient characteristics inherent in them, but also because their impact usually requires visible equipment and techniques e.g. hearing or mobility aids. Thus, the problems are marked and as such become more evident and possibly core in the children's representations, despite their awareness of the impact of other problems. When these perceptually salient difficulties are considered, there are no age effects in children's responses. However, older children provided richer and more accurate information on cognitive difficulties and dyslexia. Their understanding of the impact of some of the disabilities questioned also appeared to be broader and more advanced, in that they were increasingly more able to appreciate implications of these disabilities in many different life domains, particularly the social and emotional aspects of having a disability. This developmental shift in older children's knowledge and their increased ability to understand and discuss more abstract and less perceptually salient difficulties, such as learning disabilities or psychological disturbance (Conant and Buddoff, 1983; Safran, 1995), provides further evidence of a conceptual change in children's understandings.

Social contexts may induce or enhance these conceptual changes. Increased direct or indirect experience of disabilities led to more spontaneous mentions of 'special needs' as a difference between children and a greater awareness that an impact of a cognitive difficulty could be problems in communication. However, the more "experienced" children's increased awareness of "special needs" as a difference was not equally reflected when participants were asked other specific questions about the different disabilities. Direct or indirect experiences of people with different disabilities may have shaped the "experienced" children's perspective on how people may be different from one another, but it did not appear to greatly affect their knowledge and understanding of particular disabilities in our study. However, since experience was only assessed at a general level these results may reveal specific effects of experience of children's understandings.

The importance of context is further illustrated through the differences between the responses of the rural and urban social context. Rural children were more aware of the social impact of physical difficulties. Given the limited access to different forms of transportation, e.g. taxis, metro with disability access and so forth, young people with physical difficulties would be likely to experience reduced social contact in Greek rural environments. However these differences may also be accounted for by wider social factors. McConkey and colleagues (1983) also reported some differences between urban and rural teenagers in their sample of second-level Irish schools, but they were not sure if this difference was due to the pupils having different levels of contact with people with disabilities or due to "country ethos", while Gash and Coffey (1995) report similar findings to ours in terms of rural and urban children's expressed attitudes. Georgas (1990) has referred to the urban/ rural differences in Greece and these may in some way shape children's different understandings of the world and other people, including people with disabilities. Differences in social and familial relationships, rhythms of life and interaction with the natural environment may be relevant, however this study cannot address this issue in more detail. Although the distinction between rural/ urban appears important in certain cultural contexts this dimensions requires a more objective operationalisation in future work.

Implications

The current study demonstrates that even in social contexts where children with disabilities are rarely placed in mainstream settings typically developing children have emerging concepts of non-typical development. Despite the fact that the children had no formal education about disabilities and generally had little direct experience they were able to match problems and needs. Differences existed across types of disability with children being more aware of those problems marked by a discrete indicator. Good instructional principles start from an understanding of the pupils' state as well as from an understanding of the learning processes (see Wood and Wood, 1996). The children in this study demonstrate that a knowledge base is present to structure intervention programmes. Nonetheless, while the children's representations contained a core of accurate knowledge there were also misunderstandings and overgeneralizations. Studies in other domains have demonstrated that conceptual change can occur as a result of systematic instruction, particularly when this is supported by social experiences. Teaching the children systematically (Au and Romo, 1996) while acknowledging the richness and diversity of their representations should support conceptual change. Young children already possess a knowledge base upon which these educational experiences can be built.

To build on this base effectively the evidence presented here needs to be embedded within studies that control both for the effects of type of school and the different types of experiences the children have outside the school context. An extended attitudinal and behavioral rating scale would further clarify the links between knowledge, attitudes and behavior. The current study focused on the variability, nature and causes of different disabilities. By the age of eight, children are in the process of developing and extending their understanding and knowledge about diversity. Creating appropriate learning environments for all children involves acknowledging and working with these representations.

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LIST OF TABLES

Table 1. Number of subjects according to age, gender and place of residence

	THIRD GRADE		FIFTH GRADE		TOTAL
	Boys	Girls	Boys	Girls	
Urban	9	10	10	10	39
Rural	9	10	10	11	40
TOTAL	18	20	20	21	79

Table 2. Main Coding Categories and Key examples from the coding system

MAIN CODING CATEGORIES	KEY EXAMPLES
References to the specific nature and impact of the **disability** in question	Auditory/ communication implications (for deafness): e.g. can't hear the other people, need hearing aid, have to use sign language. Visual implications (for blindness): e.g. can't see the world, live life in darkness, need help crossing the road, have to use a walking stick. Physical/ mobility implications (for physical disabilities): e.g. can't walk or run, pains of body parts, can't go places, need a wheelchair, artificial body parts. Cognitive/ mental implications (for mental retardation): e.g. something wrong with their brain, can't think properly, can't understand things, their mind works slowly, can't learn, can't remember. Activity and attention implications (for hyperactivity): e.g. can't sit still, want to run all the time, can't pay attention.
References to the educational aspects of having different 'special 'needs'	General educational implications: e.g. can't go to school, go to special schools, need to have teachers at home. School performance: e.g. don't do well at school, fail exams. Reading and writing: e.g. can't read, can't write, don't know what words mean, confuse one letter with another.
References to the social aspects of having different 'special needs'	General social implications: e.g. can't live a normal life, can't go out to play, won't be part of society, won't grow up like the others. Implications in social relationships: e.g. have no one to play with, can't make friends, others make fun of them, can't get married.
References to the emotional aspects of having 'special needs'	e.g. they are sad, lonely, unhappy, they need more encouragement, they would like to be like other children but can't.
References to the causes of the different 'special needs'	Birth/ Hereditary causes: e.g. born this way, God made them like this, their parents had it, late delivery of baby. Accident/ Illness/ Environmental causes: e.g. high fever, car accident, burned eyes in a fire, loud noises, spinal injuries, psychological trauma, doctor's mistake.

Table 3. Means and standard deviations of children's attitudes towards school integration issues

Question	Mean (√)	Standard Deviation(s)
"like doing homework with"	4.42	0.78
"like to be in the same school with"	4.38	0.85
"like to play with"	4.05	1.09
"like to be in the same class with"	4.01	1.01
"like sitting next to a 'special needs' child at school"	3.78	1.24

Table 4. Example answers of children to the open-ended question on the differences between children (*"tell me how children can be different from one another"*)

CODING CATEGORY	EXAMPLE ANSWER
Biological/ Physical differences	"some children are white and some are black", "some children are old, tall etc, and others are young, short", etc.
Individual/ Personality	Good/ bad behaved, different in their interests, hobbies, different personality characteristics, etc.
Educational differences	School performance, reading, writing, enjoying different subjects in school, etc.
Inference to disabilities and difficulties	"some children have 'special needs', some don't", "some are blind, deaf, physically handicapped, etc, and others are not", "some children are orphans, poor, live in war, and others are not" etc.
Social/ Familial differences	"they come from different countries", "they come from different families", "they speak different languages" etc.

Table 5. Raw and relative frequencies for each of the different causal attribution categories

CAUSES OF:	*No causes*	*Only Birth*	*Only accident*	*Both*	*Total*
Deafness	19 24.1%	10 12.7%	21 26.6%	29 36.7%	79 100%
Blindness	9 11.4%	9 11.4%	37 46.8%	24 30.4%	79 100%
Physical Disability	11 13.9%	9 11.4%	37 46.8%	22 27.8%	79 100%
Mental Disability	47 59.5%	16 20.3%	7 8.9%	9 11.4%	79 100%
Dyslexia	65 82.3%	10 12.7%	1 1.3%	3 3.8%	79 100%

Table 6. Examples of children's responses of the impact of the different disabilities

Physical Impact	Can't walk, , can't go places, needs hospital, is in pain.
Communication Impact	They have to use signs, read lips, can't communicate properly with other people
Social Impact	They are lonely, don't have friends, have no one to play with, can't be part of society, won't grow up to be like the others
Educational Impact	Can't read, can't write, can't be good at school, goes to special school
Cognitive impact	Can't understand, can't think properly, do stupid things, when they grow up, they still think like children do
Emotional Impact	They are sad, unhappy, would like to be like other children but can't
Wider implications – Explicit constraints	They need to use a hearing aid (for deafness), they walk with a special walking stick (for blindness), they have a wheelchair (for physical disability), they often go to hospital/ have operations.

Table 7. Raw and Relative frequencies of children referring to the implications of the disabilities questioned by age group.

	Impact	**Physical/ Biological**[1]		**Educational**		**Social**		**Emotional**		**Cognitive**		**Communication**		**Explicit constraints** [3]	
Disability	Age Group	N	%[2]	N	%	N	%	N	%	N	%	N	%	N	%
Deafness	*young*	35	44%	11	14%	10	13%	0	0%	4	5%	15	19%	4	5%
	old	34	43%	6	8%	10	13%	9	11%	8	10%	14	18%	3	4%
	total	69	**87%**	17	22%	20	26%	9	11%	12	15%	29	**37%**	7	9%
Blindness	*Young*	32	40%	23	29%	11	14%	2	3%	0		0		26	33%
	Old	35	44%	19	24%	20	25%	2	3%	0		0		21	27%
	Total	67	**85%**	42	**53%**	31	39%	4	6%	0		0		47	60%
Physical Disability	*Young*	33	42%	12	15%	16	20%	2	3%	0		0		25	32%
	Old	37	47%	13	17%	24	30%	10	13%	0		0		31	40%
	Total	70	**89%**	25	32%	40	50%	12	16%	0		0		56	**71%**
Cognitive Disability	*Young*	10	13%	6	8%	5	6%	1	1%	11	14%	4	5%		
	Old	12	15%	8	10%	12	15%	1	1%	24	24%	10	13%		
	Total	22	**28%**	14	18%	17	21%	2	2%	35	**35%**	14	18%		
Dyslexia[4]	*Young*	0		8	10%	2	3%	0		3	4%	7	9%		
	Old	0		11	14%	5	6%	0		1	1%	19	24%		
	total	0		19	**24%**	7	9%	0		4	5%	26	**33%**		

1. Physical/ Biological category refers to the specific biological impact for each of the disabilities, i.e. auditory implications for deafness, visual for blindness and physical restrictions for physical disabilities.
2. All percentages rounded to the nearest ? ??number.
3. Explicit constraints refers to wider implications of having a disability, such as using a wheelchair, a hearing aid, a walking stick , often going to hospital etc.
4. Educational category in Dyslexia refers particularly to reading and writing skills.

Table 8. Raw and relative frequencies of number of children ($N_{total}=79$) providing 'I don't know' or irrelevant responses to each of the disability-specific questions

Disabilities	I don't know		Irrelevant/ Inappropriate responses		Examples of irrelevant responses
	Raw	%	Raw	%	
Deafness	2	2.5	5	6.3	"they don't have parents"; "they stammer"; they don't know what time it is"
Blindness	1	1.3	6	7.6	"they always stay in bed"; "they have to put their hands on the others' mouth to listen to what they say"; "they are sick"
Physical Disability	4	5.1	5	6.3	"they can't see"; "they can't hear"; "they are homeless"; "they don't have food"
Mental Disability	29	36.7	6	7.6	"when they grow up, they will be short"; "other people spoil them"; "they have tics"
Hyperactivity	67	84.8	2	2.5	"they can't move, always stay in bed"
Autism	70	88.6	9	11.4	"they have problems with their ear" mentioned by all 9 children due to sound similarity of greek word ear ('afti') with autism ('aftismos')
Dyslexia	41	51.9	4	5.1	"they always have break time in their mind"; "no one explains things to these children"; "they may fight with a child at break-time and not make up"

Table 9. Raw and relative frequencies of number of children (N_{total}=79) providing 'I don't know' or irrelevant responses to questions on the *causes* of the different disabilities

Causes of…	I don't know		Irrelevant/ Inappropriate responses		Examples of irrelevant responses
	Raw	%	Raw	%	
Deafness	15	19	3	3.8	"they don't eat properly"; "they don't have money"
Blindness	6	7.6	2	2.5	"because they are kept in darkness"
Physical Disability	5	6.3	4	5.1	"something upset them and they became that way"; "from a psychological trauma"
Mental Disability	44	55.7	4	5 .1	"they were shocked by something"; "because they didn't study"
Hyperactivity	74	93.7	0	0	-
Autism	79	100	-	-	-
Dyslexia	57	72.1	0	0	-

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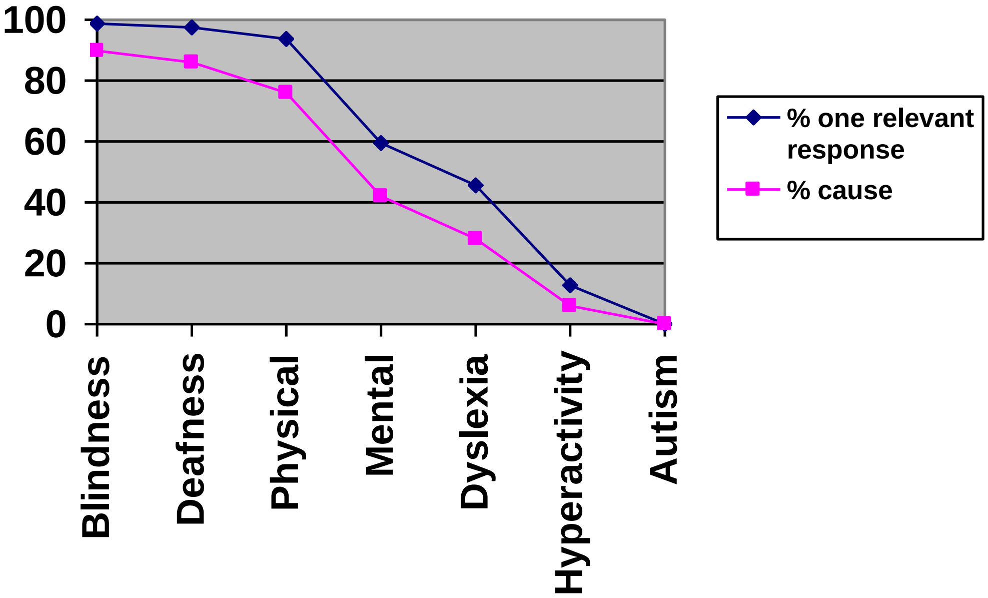
Figure 1. Percentage of children producing at least one relevant response to the specific questions about the different disabilities questioned



LIST OF APPENDICES

Appendix A The interview open-ended and specific questions

Open-ended Questions	1. Children are different from one another. Can you think of some ways in which children may be different from one another?
	2. Another difference between children is that some may have 'special needs' and some may not. There are many different 'special needs'. Can you tell me all the 'special needs' you can think of?
	3. What kind of difficulties do you think children with 'special needs' may have in their lives?
Disability-Specific Questions	4. What does it mean if a child is deaf? What difficulties might a deaf child have? Why do you think some children are deaf? What caused them to be that way?
	5. What does it mean if a child is blind? What difficulties might a blind child have? Why do you think some children are blind? What caused them to be that way?
	6. What does it mean if a child is physically disabled? What difficulties might a physically disabled child have? Why do you think some children are physically disabled? What caused them to be that way?
	7. What does it mean if a child is 'mentally retarded'? What difficulties might a mentally retarded child have? Why do you think some children are mentally retarded? What caused them to be that way?
	8. What does it mean if a child is hyperactive? What difficulties might a hyperactive child have? Why do you think some children are hyperactive? What caused them to be that way?
	9. What does it mean if a child is dyslexic (has dyslexia)? What difficulties might a dyslexic child have? Why do you think some children have dyslexia? What caused them to be that way?
	10. What does it mean if a child is autistic? What difficulties might an autistic child have? Why do you think some children are autistic? What caused them to be that way?