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International Journal of Special Education

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CONTEXT-SITUATED COMMUNICATIVE COMPETENCE IN A CHILD WITH AUTISM SPECTRUM DISORDER

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Autism Spectrum Disorder (ASD) is often linked with difficulties in triadic interaction or joint attention. This paper investigated the communicative competencies that children with ASD might have in these skills. We report findings from a pilot case study that focused on a school-aged child with ASD who interacted with his adult co-participants in various technology-enhanced contexts. The primary data consisted of video recordings that were analysed utilising mixed methods. Focusing on behaviours that were realised via the use of eye-gaze, we wanted to discover whether they would differ according to context. The results of this study show that the use of eye-gaze differed in the contexts studied. The communicative competence was revealed when the child's behaviours were not investigated in isolation but rather in relation to the context of their occurrence. This paper discusses the implications of the described context-situated view of competence and suggests widening the approaches of studies of ASD.

Introduction

Autism and Deficit-orientation

Autism, as a diagnosis, refers to impairments in reciprocal social communication and social interaction, and to presence of restricted and repetitive behaviours, interests, or activities (American Psychiatric Association, 2013). Children with Autism Spectrum Disorder (ASD) are often studied from the perspective of these abnormalities because there is an interest in identifying ASD as early in development as possible (Charman & Baird, 2002; Stiegler, 2007). The research conducted on children with ASD thus far has often focused on comparing differences in various developmental areas between children with ASD and children with typical development. Consequently, the behaviour of the children with ASD is often interpreted as pathologic due to its atypical character, resulting in a deficit-oriented approach.

Recently, a growing interest has arisen toward the competencies that the children with ASD have (e.g., Conn, 2013; Happé, 1999; Mottron, 2011; Stiegler, 2007). Also, research on the savant skills of the individuals with ASD has been conducted (e.g., Bennett & Heaton, 2012) but there is far less research on so-called low-functioning children with ASD (LFA), who have limited speech or comorbid intellectual disabilities. There is a threat that the view of autism is reduced to one of *either diminished capacity or superhuman capacity, but nothing in between* (Draaisma, 2009, 1477). Thus, our understanding of the abilities of these individuals is often divided between two polarities, and the competencies of children with LFA might be overlooked.

In order to understand ASD more comprehensively, we should focus on discovering what facilitates optimal functioning, not only on what prevents it (e.g., Linley, Joseph, Harrington, & Wood, 2006). Thus, it is worth keeping in mind that the unusual behaviour of an individual with ASD is not, by definition, less adaptive or meaningful (Dinishak & Akhtar, 2013; Mottron, 2011) but rather something to be studied in detail. In this paper, we will focus on the use of eye-gaze in a child with ASD from the perspective of communicative competence, instead of the widely documented difficulties. In this case, we understand communicative competence to be a means of using one's eye-gaze in a way that shows understanding of the particular social situation (see Duchan, Maxwell, & Kovarsky, 1999).

Triadic Interaction and Eye-Gaze Use as an Example of Deficit-oriented Research

In this paper, the term triadic interaction is understood as coordinating and sharing of object- or event-directed attention with a social partner (Bakeman & Adamson, 1984). It is a skill that is often referred to as joint attention. On a group level, children with ASD are reported to have extensive difficulties with joint attention (Loveland & Landry, 1986; Meindl & Cannella-Malone, 2011) which is thought to have a particularly important role in the development of ASD (Charman, 2003; Kasari & Patterson, 2012; Loveland & Landry, 1986). Previous research has also shown that children with ASD intentionally communicate less than children with other developmental delays or with typical development (Maljaars, Noens, Jansen, Scholte, & Van Berckelaer-Onnes, 2011; Shumway & Wetherby, 2009), and when they do communicate, their purpose is more often instrumental and imperative (e.g., aiming to receive aid from another person with pointing) than declarative (e.g., sharing an object of interest with another person via the use of eye-gaze) (Maljaars et al., 2011; Shumway & Wetherby, 2009).

Communicative intentions can be expressed in multiple ways, but often, the difficulty in seeking or maintaining eye contact seems as the most striking feature of ASD because it violates our everyday understanding of the way social encounters are realised. Also, joint attention is typically attained through the use of eye-gaze. Children with ASD differ from children with typical development in various areas related to the use of eye-gaze: they rarely look at another person for social information or to get an assurance regarding something (i.e., referential looking) (Noris, Nadel, Barker, Hadjikhani, & Billard, 2012), they do not follow another person's head turn as often as children with typical development (Leekam, Hunnisett, & Moore, 1998), and they have difficulties with gaze following (Carpenter, Pennington, & Rogers, 2002; Leekam et al., 1998). Although, it is important to notice that individual variation occurs as the spectrum of ASD is vast.

The results mentioned are often yielded by studies that are conducted in controlled settings (see Kidwell & Zimmerman, 2007). Because of this control over the elements affecting the situation, a high internal validity can be achieved, but the external and ecological validity of the research findings can be called into question (Crosland et al., 2012; Korkiakangas, 2011). Previous research has shown that context affects the behaviour of children with ASD and other disabilities (e.g., Holt & Yuill, 2013; Olsson, 2005; Roos, McDuffie, Weismer, & Gernsbacher, 2008), and thus, the children with ASD might have individual competencies that are not revealed without altering the research approach. This made us interested in investigating and understanding triadic interaction in relation to the context in which it naturally occurs (see Kidwell & Zimmerman, 2007; Wetherby, 1986). We also wished to consider the behaviour of the co-participants the child is interacting with because much of the research in this area has focused solely on the child, paying less attention to the immediate social context (Adamson, Bakeman, Deckner, & Nelson, 2012; Olsson, 2005; Stiegler, 2007).

Research on triadic interaction, or joint attention, has mostly been conducted using quantitative methods. With the use of a quantitative approach comes the need to strictly predetermine the behaviours of interest based on existing theory, instead of approaching the phenomenon in terms of the data and subjects. The downside of these theory-based coding schemes is that they can overlook the distinctive ways of interaction that children with ASD might have or define them as mere abnormalities (see Stiegler, 2007). Thus, the purpose of this paper is to provide an alternative perspective on the triadic interaction skills of a child with ASD by considering the related communicative competencies. We present findings from a pilot case study (Tuononen, 2012) that investigated a child with ASD's multiple ways of sharing attention via the use of multiple gestures including, for example, pointing and verbalisations. In this paper, we focus solely on the use of eye-gaze to acquire an understanding of it in relation to both the social and the physical contexts in which it occurs. By focusing on a child with very limited speech, the study aims to consider the communicative competencies of the children with so-called LFA, who are not often included in studies.

Methods*Research Design*

As a pilot study, the aim was to try out a new approach to acquire an alternative perspective to an extensively studied phenomenon of triadic interaction. A mixed-methods design was chosen to fulfil this aim. Quantitative methods were used to examine the use of eye-gaze in various contexts, which was followed by a qualitative micro-analysis. As a case study, the focus was on the phenomenon of triadic

interaction. This focus was chosen to understand the behaviour of a particular child in context, not in isolation, in order to individualise rather than to categorise (see Grove, Bunning, Porter, & Olson, 1999). Thus, our approach could be described as person-centred rather than variable-centred (Olsson, 2005). The choice to focus on a single child and his co-participants enabled a focus on contextual details. The extent that this study focused on the co-participants is similar to that of Alexandersson's (2011): they were part of the context in relation to which the child's behaviours are to be understood.

Research Setting and Participants

Research Setting. The study took place at the technology club sessions organised by the Everyday Technologies for Children with Special Needs (EvTech) project. In these club sessions, children with various special needs worked for approximately 10 to 15 minutes with their parents and club tutors at several technology-based action stations that were developed in the EvTech project. The working times at the action stations were fixed for each session. The EvTech club was designed as a leisure program, not a targeted intervention, and thus, the children were not forced to complete the game-based tasks if they did not want to.

Three of the action stations were selected for investigation: the dance mat station, the symbol matching station, and the LEGO® building station. They were chosen because the activities differed from one another, as the following descriptions will show.

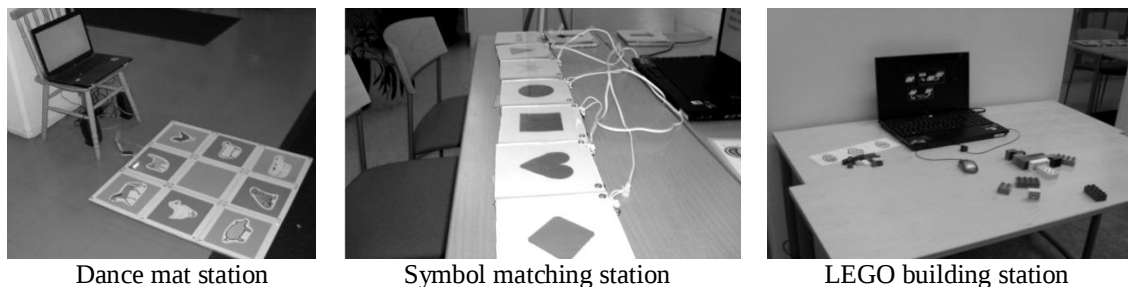


Figure 1. Photographs of the technology action stations: Dance mat station, Symbol matching station, and LEGO building station.

These three action stations (see Figure 1) enabled the child to choose from a variety of games. At the dance mat station¹, one of the games required the child to place his hands and legs on certain places on the mat, following the instructions given on the computer screen, to practice, for example, his motor skills and visual or auditory perception. The child's parent and the club tutor often followed the child, standing next to the dance mat.

At the symbol matching station², the games included matching the colour on the screen to a shape on the buttons and playing a memory game in which the child needed to memorise the symbol shown on the screen to practice, for example, visual search and sustained and divided attention skills. The child's parent and the club tutor often watched the child play by sitting next to him at the station.

At the LEGO building station³, the child was presented with a block model on the computer screen. The child was instructed to recreate the image using commercial LEGO or DUPLO® blocks. The game could also be played as a memory game in which the model to be built had to be memorised. The child could practise, for example, his spatial perception, and with the memory game, he could practice memory-related skills. The parent and the club tutor typically sat next to the child at the station. Unlike at the other two stations, the parent and the tutor often took part in the activity with the child.

Participants

The child in this study was chosen because he was diagnosed with F84.0 autism (ICD-10 criteria: World Health Organization, 1992) and had limited speech. He was chosen to increase knowledge regarding children with LFA.

At the time of this study, the child was eight years old. According to the child's parents, his development had been typical until what they described as total verbal regression, or word loss, near his second birthday. He attended a school for children with special needs and needed comprehensive support for all daily activities. His medical documents stated that he had very limited functional speech but that he did occasionally use words, for example, in requests, and that he understood speech well. According to his

parents, the child did not like loud noises, and it was suspected that he had over-sensitivity to sounds. The medical documents also stated some skills that the child had. For example, his motor skills were assessed as good, and visual perception and visual memory were described as his strengths. The co-participants in the study were the child's parent and two club tutors. One of the tutors was a Master's student in Special Education and the other was a teacher with training in Special Education. The child was familiar with the tutors because they had been working with him prior to the data collection. The child and his family were clients in the organisation responsible for the EvTech clubs due to the child's need for extensive care. The family was offered the chance to participate in the club. The participation was voluntary, and written informed consent was obtained from the participants prior to the start of the club. The child's parents reported that he enjoyed coming to the EvTech club meetings and that he was also interested in computers and other technologies at home.

Measures

The eye-gaze behaviours were observed from the videos, using a coding scheme developed for the study. The coding scheme was based mainly on the Early Social Communication Scales (ESCS: Mundy et al., 2003) with Roos et al.'s (2008) modifications and on the definitions of the Social Communication Assessment for Toddlers with Autism (SCATA: Drew, Baird, Taylor, Milne, & Charman, 2007). Because children with ASD vary greatly in their symptoms and skills, it was necessary to abandon some of the predefined definitions to capture the communicative competencies of the child studied, and hence the scheme was individualised for the purposes of this pilot. For example, the demand for actual eye contact or gaze towards the eyes of the other person is often highlighted (Mundy et al., 2003), instead of looking at the face area. Bypassing these other, more atypical ways of interacting would result in ignoring potentially communicative behaviour (see Olsson, 2004), and this potential was where we wished to target our study.

Various versions of the coding scheme were frequently commented on by professionals from the field of Special Education, and an inter-rater reliability study took place during the construction process. These procedures led to a coding scheme for various behaviours related to triadic interaction, via which the use of eye-gaze is investigated in this paper. The behaviour categories, along with operational definitions, data samples, and the theoretical background, are presented in Appendix.

Data Collection

The data pool of video recordings extended over the fall of 2009 and the spring of 2010. From these, six out of 18 club sessions were selected for further analysis covering total of seven months. The selection of the sample was based on the representativeness of the data (sessions covered both the fall and spring semesters, and all three action stations were included) and the quality of the data (videos were recorded from an angle that enabled the analysis). The data analysed contained 18 action stations sessions: six sessions at every action station, with 10 to 15 minutes of work at each. Interpretations made based on the video data were viewed against additional data that were either collected for this research or were accessible through the EvTech club: interviews with the child's parents and his speech therapist, field notes from the EvTech club, and the club tutors' written feedback, which was given after every club session.

Data Analysis

The analysis proceeded from the identification of the behaviours of interest (i.e., eye-gaze) to the examination of quantitative differences between the action stations in relation to these behaviours, and concluded with a qualitative micro-analysis. The behaviours were coded from the data via the coding scheme by using ELAN software (Max Planck Institute for Psycholinguistics, 2014). With this software, it was possible, for example, to synchronise the videos that were recorded from different angles and view them side-by-side on the computer screen (see Brugman & Russel, 2004). At time, the participants were only partially visible to the camera due to the naturalness of the setting, in which all possible movements and directions were impossible to estimate. Thus, at time, the coding of the eye-gaze was based on head position but only in circumstances where the eye-gaze direction could be inferred with a certainty (i.e. when someone enters the room and the child turns his head).

The statistical analyses were based on frequency counts of the coded behaviours at the action stations. The tests were non-parametric with Bonferroni corrections. The differences between the three technology-based action stations were analysed with a Kruskal-Wallis test ($n = 18$), which was followed by pair-wise comparisons with the Mann-Whitney U test ($n = 12$). The statistical analyses were conducted with PASW Statistics software. The Kruskal-Wallis test was chosen because we hypothesised

that the differences between the action stations would not be systematic across club sessions and we wanted to see whether the behaviours at the action stations differed overall.

The purpose of the data-driven qualitative micro-analysis was to understand the behaviour of the child by viewing the coded data systematically multiple times, paying attention to the context, that is, to the immediate antecedent and concurrent events of the eye-gaze behaviours. The analysis was guided by the identification of similarities and differences in occurrences of the behaviours. The declarative and imperative purposes of the behaviours were interpreted solely on the basis of the context of their occurrence (e.g. Schegloff, 1993), which is in contrast with more theory-based practices. The data were transcribed in part to create illustrative data samples, but the actual analysis was based on the visual, not the textual, content. The analyses were conducted by the first author, but they were overseen and critically discussed with the other authors. Interpretations were also re-examined against the additional data (see Data Collection).

Results

Quantitative Approach

The quantitative differences in the eye-gaze behaviours between the action stations were examined based on frequency counts at each of the six EvTech club sessions. Table 1 shows the means and standard deviations for the eye-gaze behaviours at the three action stations. The total frequency counts of all the studied eye-gaze behaviours are summarised in Figure 2.

Table 1. Means and Standard Deviations of Eye-gaze Behaviours per Session at the Three Action Stations

	LEGO building station	Dance mat station	Symbol matching station
Behaviour category	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Gaze directed at the co-participant's face	2.00 (1.41)	0.67 (0.82)	7.00 (4.00)
Gaze directed at the co-participant's body or action	12.50 (6.16)	2.67 (1.75)	5.83 (5.27)
Shifting the gaze between the co-participant's face and an object	1.67 (1.86)	1.00 (2.00)	9.33 (5.72)
Following the co-participant's gaze	0.17 (0.41)	0	0
Gaze directed at people near the action station	1.83 (1.84)	0.83 (1.33)	13.67 (10.71)
Looking at an object or in a direction that is pointed out or otherwise presented	15.17 (6.56)	3.67 (5.24)	7.50 (5.13)

Note: Due to the lack of occurrence in two of the three contexts in following the co-participant's gaze, no further analyses were made

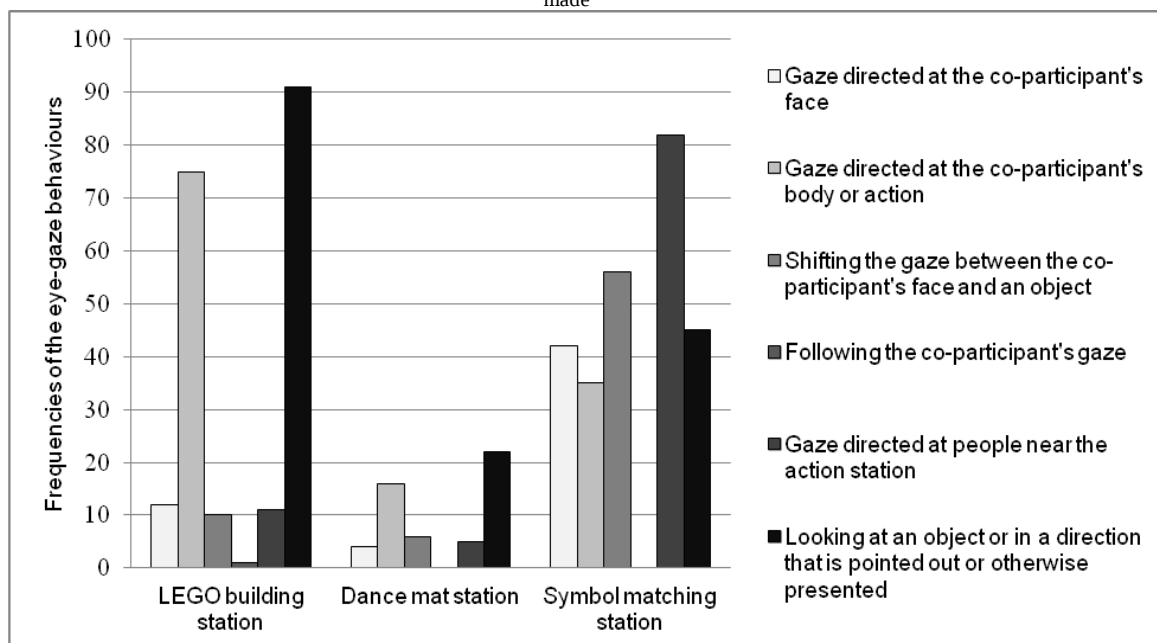


Figure 2. Total frequency counts of the use of the eye-gaze at the three action stations across club sessions

The frequencies of these eye-gaze behaviours at each of the action stations during the six club sessions were compared with one another. There were statistically significant differences in the use of *gaze directed at the co-participant's face* when the three action stations were compared to one another ($\chi^2 = 11,946$, $p = .0005$). When the child was working at the symbol matching station, he directed his gaze at the co-participant's face more frequently than while working at the dance mat station ($U = 0,000$, $p = .002$) or the LEGO building station ($U = 2,000$, $p = .011$).

In addition, the *gaze directed at the co-participant's body or action* showed statistically significant differences between the action stations ($\chi^2 = 7,287$, $p = .019$). When the child was working at the LEGO building station, these directed gazes occurred more often than while he was working at the dance mat station ($U = 1,000$, $p = .004$).

The differences between the action stations regarding *shifting the gaze between the co-participant's face and an object* were also statistically significant ($\chi^2 = 9,192$, $p = .005$). This kind of eye-gaze use occurred more often at the symbol matching station than at the LEGO building station ($U = 3,000$, $p = .015$) or dance mat station ($U = 2,000$, $p = .009$).

Also, the amount of *gaze directed at people near the action stations* showed statistically significant differences among the action stations ($\chi^2 = 9,967$, $p = .003$). While working at the symbol matching station, the occurrence of this kind of eye-gaze use was more frequent than at the LEGO building station ($U = 2,500$, $p = .011$) or at the dance mat station ($U = 1,500$, $p = .006$).

In addition, the amount of *looking at an object or in a direction that is pointed out or otherwise presented* showed statistically significant differences among the action stations ($\chi^2 = 8,080$, $p = .011$). There were more of these behaviours at the LEGO building station than at the dance mat station ($U = 2,000$, $p = .009$).

From Figure 2, one can see that *following the co-participant's gaze* was not observed at the symbol matching station or at the dance mat station, and it occurred only once at the LEGO building station. Thus, no further conclusions are made regarding this.

Qualitative Approach

The eye-gaze behaviours described above were further analysed with qualitative micro-analysis. In the examples below, the following abbreviations are used to indicate the child (C), the parent (P), and the club tutors (T1 and T2), as well as symbol matching station (S), LEGO building station (L), and dance mat station (D). Also, the number of the club session (1-18) and the time code (hh:mm:ss.ms) from the video recordings are presented.

Gazes directed at the co-participant's face and *shifting the gaze between the co-participant's face and an object* typically occurred at the symbol matching station, which as a context, seemed to support interaction with the co-participants. Thus, these behaviours were interpreted to relate, for example, to showing interest in one's social environment, such as the case in which the parent was talking with the club tutor.

P tells T1 that C might be able to read. While this happens, C gazes at P's face (S, club session 9, 00:07:41.520–00:07:42.600).

P talks to T2 while C plays the game. C gazes at P's face and then shifts gaze back to the computer screen (S, club session 7, 00:00:20.000–00:00:21.110).

A potential explanation of the major occurrence of *gazes directed at the co-participant's face* and the *shifting of the gaze between the co-participant's face and an object* at the symbol matching station was that their function was related to the possibility of feedback from the social environment. The child was skilled in playing the symbol matching games, and the experience of success and praise from the parent and the club tutor was interpreted to motivate the child to seek contact with them as the following sample from the symbol-matching station shows.

C presses the correct button and looks at P (S, club session 15, 00:03:53.534–00:03:54.520).

Overall, the triadic nature of the behaviours was revealed through the analysis of the context of their occurrence, not through their form. The child was interpreted as enjoying watching the time line of the game, which showed how much time the child had left for the task at hand, decrease. Just before the time would finish, the child pressed the correct button and sometimes laughed. During this, he would often gaze at people near him, which was in some cases interpreted as desiring to impress them.

C has waited (once again) for the time to react to run out, but just before that happens, C presses the button. C laughs and looks at T1 (S, club session 9, 00:05:30.760–00:05:37.860).

Thus, these behaviours could be described as often having a declarative purpose. Sharing an event or object was interpreted as their main function, especially when they were accompanied by smiles or laughter. Also, the symbol matching station, as an activity and environment, created situations relevant to the use of *gazes directed at people near the action station*. The child was good at playing these symbol matching games, and therefore, he often had a lot of spare time for observing his surroundings while waiting for the next task to appear on the screen.

C follows P, who is leaving the situation, with his gaze. T1 says: *P will be back soon* (S, club session 15, 00:08:58.370–00:09:03.210).

C turns his head and looks in the direction that P has left (S, club session 15, 00:09:05.476–00:09:07.600).

Without this micro-analytic approach, it would have seemed that the child was not interested in the activity at this action station, because his attention was quite often elsewhere than on the screen. When working at the LEGO building station, *gazes directed at the co-participant's body or action* were more characteristic of the child than when working at the dance mat station. This was interpreted as relating to the side-by-side working of the child and the club tutor because the club tutor was often building the same kind of model as the child. Thus, the way in which the activity was organised at this action station produced situations in which *gazes directed at the co-participant's body or action* were relevant, unlike at the dance mat station. The child often gazed at the club tutor's hand as she was using the computer mouse in situations in which the task was completed and he was ready to move on. Therefore, this kind of eye-gaze use was seen to serve an imperative purpose: to ask help in continuing to the next task. The following sample will illustrate this.

T1 has selected a memory game as the next game. C has been given instruction to look at the computer screen and to try to remember the LEGO block model presented on it. C has gazed at the screen and then shifted his gaze to T1's hand that is on the computer mouse (L, club session 17, 00:03:20.320–00:03:21.400).

T1 presses the mouse button, which makes the model, which C is supposed to replicate, disappear. C makes voices, smiles, and stiffens his hands against his chest. He looks at the computer screen (L, club session 17, 00:03:21.910–00:03:22.910).

Also, the imperative purpose of these behaviours was evident in situations in which the child's *gaze being directed at the co-participant's body or action* preceded an act of attempting to take, for example, the computer mouse from the club tutor's hand.

T2 tries to start the game. C shifts his gaze to T2's hand that is using the computer mouse (L, club session 7, 00:06:52.800–00:06:53.860).

C grabs T2's hand and tries to take the computer mouse. P interrupts and says: *Don't touch that* and takes C's hand away from the computer mouse. C looks at the mouse (L, club session 7, 00:06:53.870–00:06:56.190).

Looking at an object or in a direction that is pointed out or otherwise presented also occurred at the LEGO building station more often than at the dance mat station. Likewise, this can be attributed to the co-operative nature of the activity, which created possibilities for the child to respond to the triadic interaction bids of the co-participant. The activity in itself also seemed to be motivating enough for the child to be responsive. The following sample from the LEGO building station illustrates these.

P grasps C's LEGO construction and lifts it next to the model presented on the computer screen. P: *Look, it's alike*. C turns to look. C makes sounds and claps his hands simultaneously (L, club session 9, 00:02:55.105–00:02:57.250).

None of the eye-gaze behaviours studied was characteristic of the dance mat station – it can even be stated that their absence was characteristic of the dance mat station. When these behaviours did occur, they often reflected the challenges encountered by the child while working at this action station and often thus carried an imperative purpose. For example, the *shifting of the gaze between the co-participant's face and an object* was sometimes present, especially in situations in which there were some unexpected difficulties with the use of technology. In these situations, the child was interpreted as asking for help by shifting his gaze between the co-participant's face and the event as in the following sample.

C has tried to press the buttons of the dance mat with his feet multiple times, but the software does not respond. C looks at P's face (D, club session 7, 00:35:53.304–00:35:54.343).

In addition to the occasional difficulties with the functionality of the technology, the tasks at the dance mat station seemed challenging for the child. Thus, he would engage in activities that were somewhat disobedient in nature but would show enjoyment, for example, during declarative *gazes directed to the co-participant's face*. The following sample illustrates this.

C laughs and looks at T1's face (after trying to shut down the computer) (D, club session 11, 00:03:41.900–00:03:43.752).

As the results above show, although most of the studied eye-gaze behaviours were observed occasionally at all of the three action stations, their occurrence and meaning was related to certain context-specific social situations.

Discussion

The purpose of this pilot study was to examine the potential of communicative competence of a child with ASD to complement the existing research on the widely documented difficulties in the use of eye-gaze in triadic interactions. The study investigated whether the use of eye-gaze differed according to the context and examined these observed triadic interactions in detail. The contexts that were included in the study were three technology-based action stations of the EvTech club.

The fact that the contexts of the study were natural and the child was familiar with them differentiates this study from studies using more structured settings. These two are important qualities. Wetherby (1986) states that unfamiliar and challenging environments should be utilised only if one aims to study the deficits that individuals with ASD have. Our study supports the view that contextual elements are important in the identification of communicative competence. For example, the challenging nature of the activity at the dance mat station is intriguing because the main idea of the activities at this action station and the symbol matching station is the same: to match symbols. It was difficult for the child to complete the activities at the dance mat station because the mastery of the medium (i.e., the concrete dance mat) seemed to be demanding for him in itself. Also, at this action station, there were regular problems with the functionality of the technology, which caused the child to face additional challenges, unlike at the other two action stations, and these challenges seemed to cause the child to withdraw from seeking contact. Thus, differences not only in the content of the software but also in the realisation of the activity as a whole affected the child's behaviour.

It is not in the interest of this paper to attempt to deny the developmental challenges faced by children with ASD, but rather, to emphasise that although children with ASD show symptoms characteristic of their diagnosis, they may not do so independent of a specific context. Thus, various contexts should be used when assessing these children (see Roos et al., 2008) as an observed lack of behaviours in one context cannot be taken as an indicator of a more general deficit (see Holt & Yuill, 2013). These are to be considered in order to acquire an understanding of the role of the contextual factors. These may not be of a high importance in relation to the actual diagnosis but are valuable regarding the planning of the possible pedagogical and rehabilitative practices.

The findings of this study repeatedly showed that the studied child's use of eye-gaze was context-situated. The number of ways of using eye-gaze varied over the action stations. Both the social and physical environment of the child affected the child's behaviour (see also Alexandersson, 2011; Meadan,

Halle, Ostrosky, & DeStefano, 2008), and thus, the view of communicative competence regarding triadic interactions differed depending on the context in which the child was observed. These findings are in line with those of Holt and Yuill (2013), who noticed the striking difference in children's behaviours in different contexts. This provides a valid reason to conceptualise triadic interaction as a context-situated phenomenon and to use multiple settings when studying these skills (see Olsson, 2005).

Our aim was to understand the behaviour of the particular child studied, but the results highlighted the fact that in order to accomplish this, one should not focus solely on the child but also on the social context of the child's behaviours (e.g., Adamson et al., 2012; Grove et al., 1999). Thus, the child's triadic interactions and the communicative competence in these skills are not seen as something intra-psychological, but as outcomes of the interactional context and thus as inter-psychological phenomena (see Kidwell & Zimmerman, 2007; Korkiakangas & Rae, 2013). Recently, Conn (2013) has suggested this kind of context-thinking to be helpful for autism research in general. Overlooking the social context of the child's behaviour might provoke the tendency to view the observed difficulties as inner features of individuals with ASD making it almost a built-in quality of the research.

The perspective adopted in this paper emphasised the individual ways of interacting that the child used by taking into account behaviours that are often excluded from studies of triadic interaction or joint attention based on their seemingly less social nature, for example, *gazes directed at the co-participant's body or action*. Consequently, in order to capture the competencies, it was regarded as important to view all the behaviours as potentially meaningful and not to consider unusualness to be a deficit by default (e.g., Dinishak & Akhtar, 2013; Mottron, 2011; Olsson, 2004). This was achieved by individualising the coding scheme to include such behaviours. Also the use of a mixed methods approach enabled us to gain a view of the child's communicative competencies. With purely quantitative methods, one is able to identify situations in which certain behaviours occur but unable to say much about their relevance, significance, or meaning (Schegloff, 1993). Thus, the context in which the behaviours occurred revealed their triadic nature, which would not have been apparent with purely theory-based categories. Based on the results, it can be suggested that the term triadic interaction or joint attention is operationalized broadly enough. Individualising the coding scheme is not equal to giving up on detailed category definitions and making subjective interpretations but to allowing a greater variety of individual skills to be observed.

Implications

Although the findings are difficult to generalise to the heterogeneous group of children with ASD, the understanding gained on the individual level is important in itself. The skills of one child with ASD are still a meaningful sign of competence to be noticed and considered. Indeed, the understanding of the meaning of the context-situated elements of the behaviour of a particular child can help in supporting his or her communicative competence. From the pedagogical point of view, this study showed that with various contextual elements, it is possible to either enable or disable certain behaviours (see also Alexandersson, 2011; Holt & Yuill, 2013). Thus, designing and utilising contextual elements to support these children is vital, although, more research targeted on these elements is needed.

With respect to rehabilitation of these children, if the atypical behaviour of the children with ASD is not regarded merely as a deficit or difficulty, we can gain a better understanding of the reasons for their behaviour, which will enable us to better support them. Grove et al. (1999) interestingly pointed out that without assuming that there is the potential for communication, there will be no communication to discuss or to study. Also, a more individualised understanding should be widened from therapy settings to include the area of research as well (e.g., Fischer, 1994, 45). Such an approach would benefit, for example, the development of educational programmes, which do not always take advantage of the abilities of individuals with ASD. Instead, they often attempt to suppress their autistic features (Mottron, 2011). Not seeing a difference as a deficit but as a different way or style of doing things (e.g., Happé, 1999) could benefit not only research practices but also intervention planning.

The study has also important implications for research practises. It can be suggested that the unit of studies and interventions regarding ASD should not be the child in isolation but a co-participant-child dyad (e.g., Shotter, 1986) in order to understand interaction as a reciprocal and dynamic concept instead of a discrete and static one (see Grove et al., 1999). Thus, the child's interaction should be studied in relation to that of the co-participant (Kidwell & Zimmerman, 2007; Korkiakangas, 2011; Stiegler, 2007). This could be achieved methodologically by applying conversation analysis as a method of analysing the sequences identified with a coding scheme, such as the one used in this study. Although ASD has been

previously studied with conversation analysis (e.g., Geils & Knoetze, 2008; Korkiakangas, 2011; Korkiakangas & Rae, 2013; Stiegler, 2007), mainstream research on ASD has not yet adopted this kind of a methodology. Moving in this direction would be beneficial because traditional theory-based research seems to face challenges in identifying the small initiatives of the children with ASD. Also, strict theory-based operational definitions might not take into account individual ways of behaving. Applying a more rigorous conversation analytic framework and analysing both the immediate antecedents and the consequent events was not within the scope of this study, but would be the correct direction to pursue in the future.

Overall, this pilot study does not suggest that we should deny the objective challenges that children with ASD have but rather that we should support the genuine strengths. The aim of this perspective is not to replace deficit-orientation but to complement it (see Linley et al., 2006). This perspective on the skills of individuals with ASD has implications for the well being of these individuals, and on a general level, it allows the variety and individuality among children with ASD to be seen. Also, according to Grove et al. (1999), it is a matter of dignity and respect to recognise that a person can and does communicate.

Limitations of the Study

Regarding the fact that this study is a pilot, there are some limitations to be mentioned. The analysis of the behaviours of the parent and the club tutors were beyond the scope of the present study, and thus, no information regarding, for example, the number of prompts that the child did or did not respond to can be drawn from the study. Likewise, no further conclusions can be drawn regarding the *following of the co-participant's gaze*, which occurred only once. The lack of these behaviours is important in itself and may reflect the challenges this child had. There is also a methodological reason for the low number of occurrences that is related to the number of verbal instructions given to the child by the parent and the club tutor. It was extremely difficult to make conclusions regarding what could have been the cue that the child followed. Also, the systematic analysis of the eye-gaze behaviours' initiative or responsive nature was not within the scope of this study and remains as a future direction.

In addition, the study can be criticised for the very fact that the analysis of the use of eye-gaze was based on video data. Mobile eye-tracking technology would provide more accurate measures (e.g., Falck-Ytter, Fernell, Hedvall, Von Hofsten, & Gillberg, 2012; Noris et al., 2012), but its use would also demand careful planning and habituation periods for the children in order to keep the setting as natural as possible. Our future research has taken this direction and such a technology will be used. In addition, although the inter-rater reliability was assessed during the construction of the coding scheme to guarantee the reliability of the categories, the final analysis was conducted by the first author without another inter-rater reliability study. To avoid bias the analysis was discussed with Special Education professionals during the analysis process.

Because there was only one child in this study, comparisons to other children with ASD or with typical development could not be made. This case study approach should not be seen as a limitation in itself (see Flyvbjerg, 2006), but in the future, it would be useful to study the phenomenon also on a group level.

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Appendix

Behaviour Categories, Operational Definitions, Data Samples, and Theoretical Background

Behaviour category	Operational definition and data sample	Theoretical background
Gaze directed at the co-participant's face	The child looks at the co-participant's face. This includes reciprocal eye contact and a gaze directed towards the eyes or face of the co-participant. E.g., C finishes his LEGO building, and T1: <i>Finished, finished</i> . C turns to look at T1. T1 does not notice. (L, club session 14, 00:04:23.570–00:04:25.470)	Based on video data, it is difficult to analyse whether the child's gaze is directed at the eyes or face of the co-participant. Actual eye contact or gaze directed at the eyes of the co-participant are not presupposed by some authors (e.g., Clifford & Dissanayake, 2009), which is in contrast with the view of others (e.g., Drew et al., 2007; Mundy et al., 2003).
Gaze directed at the co-participant's body or action	The child observes the actions of the co-participant by directing his gaze towards his or her body or actions. E.g., P presses a button on the dance mat with his foot. C observes. (D, club session, 7, 00:35:55.596–00:35:57.204)	Drew et al. (2007) also define the purpose of a <i>look to the examiner without eye contact</i> as an attempt to monitor the co-participant's actions.
Shifting gaze between the co-participant's face and an object	The child shifts his gaze between an object and the co-participant's face (object-co-participant-object or co-participant-object-co-participant). This includes reciprocal eye contact and a gaze directed towards the eyes or face of the co-participant. E.g., T2 is about to leave. C looks at T2 and then returns his gaze to the computer screen. (L, club session 7, 00:06:49.730–00:06:51.100)	Wetherby et al. (2007) define <i>gaze shifts</i> similarly. Also, Drew et al. (2007) apply <i>gaze shift</i> , but they require, for example, the co-participant to not affect the child. When analysing a natural, unstructured setting, it is impossible to separate whether the child followed a verbal or non-verbal prompt.
Following the co-participant's gaze	The child directs his gaze towards the face of the co-participant and then follows his or her gaze to an object or in a direction that he or she is looking at. If the co-participant suggests this gaze shift by pointing, code as <i>looking at an object or in a direction that is pointed out or otherwise presented</i> . E.g., P says: <i>T1 is also building</i> , and gazes at T1's construction. C shifts his gaze to the construction. (L, club session 17, 00:01:26.580–00:01:26.800)	Mundy et al. (2003) describe <i>following the line of regard</i> as the child turning his head or shifting his eye gaze where the tester is pointing. Here, these are coded as <i>looking at an object or in a direction that is pointed out or otherwise presented</i> , and <i>following the co-participant's gaze</i> only includes following the actual gaze shift of another person (e.g., Sigman & Kasari, 1995).
Gaze directed at people near the action station	The child follows persons or events that are not in the immediate social context with his gaze. This includes situations in which the co-participant who has previously been the target of the child's attention leaves the context, which results	Drew et al. (2007) describe <i>monitoring</i> as a look that does not seek to engage a person but to see what is happening. Thus, it is non-social. On the other hand, Holth (2006) describes <i>interactive monitoring</i> and notes that

in the child looking in the direction in which the co-participant is heading or has already exited. E.g., C looks at the hallway where a person walked that was previously observed by C. (S, club session 15, 00:05:45.330–00:05:50.133)

the child might *keep an eye on* a person nearby to detect their possible initiations. Here, these looks are regarded as potentially social.

Looking at an object or in a direction that is pointed out or otherwise presented

The child directs his gaze towards a direction that is pointed out or an object that is shown to the child. The co-participant might combine verbal prompts with these behaviours, but those occurring without pointing or showing are not coded. E.g., C sits on the dance mat and runs his fingers on the keyboard. T1 is next to him. T1 points at a target on the computer screen and says: *Click here, click here*. C turns his gaze to the target. (D, club session 17, 00:08:40.232–00:08:41.212)

Similar to the *turning head or shifting gaze in response to examiner verbal and gestural attention-directing cue* defined by Roos et al. (2008). See also Mundy et al. (2003) for *following the line of regard*.

Note: C = child, P = parent, T1/T2 = tutor1/tutor2, L = LEGO building, S = symbol matching, D = dance mat

Endnotes

¹ The software and materials used at the dance mat station were developed in the EvTech project

² The software and materials used at the symbol-matching station were developed in the EvTech project

³ The software used at the LEGO building station was developed in the EvTech project but was built based on the LDraw™ open standard for LEGO CAD programs. The materials used at the station were commercial LEGO and DUPLO blocks.

EDUCATIONAL SERVICES FOR TIBETAN STUDENTS WITH DISABILITIES LIVING IN INDIA: A CASE STUDY

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This case study describes services for students with disabilities at Karuna Home in Bylakuppe, Karnataka, India, a residential facility established to address the needs of individuals whose parents are primarily Tibetan immigrants. Interview, observation, and document review data collected over three months were used to describe and explain sociocultural and educational aspects of the school. Findings indicate that service providers embrace Tibetan Buddhist beliefs about individual worth and charitable service that can benefit the children and their caregivers in this life and the next, and that karma and other factors play roles in disability. Areas of concern and needed professional development are described, including effective assessment of academic and behavioral needs, improved planning and instruction using data-based objectives, and reliable monitoring of student progress toward intended learning and behavioral outcomes. Study findings can inform others who endeavor to provide similar services to individuals with disabilities in small or unique populations.

Introduction

This case study describes services for students with disabilities at Karuna Home in Bylakuppe, Karnataka, India. Karuna Home is a residential rehabilitation center for students with cognitive or physical disabilities who are primarily children of Tibetan refugees. While education is generally below par in Tibet, it is of particularly low quality for students with disabilities (Postiglione, 2009; Postiglione, Jiao, & Xiaoliang, 2012; Zhiyong, 2008). Many Tibetans leave their homeland due to government restrictions, and some seek refuge in Tibetan settlements in India, where some education is successful. Schools for individuals with disabilities in India are operated by the government or private entities, and students have the freedom to attend either (Singal, 2006). But the costs of better schools make them essentially inaccessible to many children because of family financial limitations (Thirumurthy & Jayaraman, 2007; Vakil, Welton & Khanna, 2002). This and other barriers to effective special education for people in India, including children of Tibetan immigrants, have been identified (Addlakha, 2007; Kalyanpur & Gowramma, 2007; Murdick, Shore, & Chitooran, 2004; Scheidegger, Lovelock, & Kinebanian, 2010; Waldman, Perlman, & Chaudry, 2010). Karuna Home was established to help surmount these barriers for a small and specific group of individuals.

Karuna Home, located near large Tibetan refugee settlements and monasteries, is administered by a principal/founder and a vice principal. The principal oversees daily operations and reports to a voluntary board of trustees (Gatsal, 2008). Staff include paid workers and volunteers serving as teachers, caregivers, supervisors, and cooks.

Students living at Karuna Home receive a range of care and rehabilitation, including daily living assistance, yoga instruction, traditional Tibetan oil massages, physical therapy, special education, exercise, toilet training, self-care, speech therapy, music therapy, English studies, tailoring studies, and health care (Gatsal, 2008). Those with the academic ability to communicate and perform daily living tasks attend school (Gatsal, 2008). Specific person-centered educational goals listed in some student profiles include high expectations such as learning English or tailoring skills. Students with the most

severe disabilities do not participate in school, but are limited to physiotherapy, massage, and other treatments.

The purposes of this study were to examine and describe the services provided to Karuna Home students, and to identify areas of needed improvement. Karuna Home was chosen because of its uniqueness in India and because the authors have experience with another program in south India working with local children and adults with disabilities. The study investigated sociocultural attitudes and educational practices at the school, guided by two study questions:

- (1) How do adults at the school describe and manifest their attitudes toward the students and their disabilities?
- (2) How effective are current educational practices for meeting the academic and behavioral needs of the students with disabilities?

Findings describe Karuna Home, the students and their disabilities, adult attitudes toward the students, intended learning outcomes, assessment, curriculum and instruction, staff and administrator training, and perceptions of needed improvements.

Method

Case study was chosen to answer the study questions based on Yin's (2009) assertion that case study is appropriate for answering *how* and *why* questions in the context of "contemporary events" (p. 8). No other published research has been conducted at this or similar schools; hence, no data are available to describe or explain its sociocultural environment or educational program. The study procedures were designed to collect and triangulate information about both of these topics, in part to provide a launching point for school improvement and in part to add to the research literature concerning programs for individuals with disabilities in small or unique populations. In this regard, the study of one case as a means to better understand similar cases can be both instructive and informative (Gerring, 2007). The study began with the researcher's entry into Karuna Home and continued with the data collection procedures.

Entry

Before traveling to the site, the lead researcher communicated by email and telephone with the Karuna Home administrator, introducing herself, explaining the study's purpose, providing a statement of human subject research approval, and requesting local approval and assistance. Ongoing communication invited comment about the research questions and proposed methods in order to refine the study and familiarize all parties prior to implementation. Once on site, the researcher spent one week building rapport with the administrators, teachers, and students before initiating formal interviews and observations.

Participants

Participants were adult interview informants and students being observed. The nine interview informants included six teachers, one physiotherapist, one administrator, and one teaching assistant. All informants were Tibetan, six female and three male, ages 21–44, with various levels of education and training and 3 months to 8 years of experience at Karuna Home. The thirty students observed included twelve females and eighteen males with mild, moderate, or severe disabilities, ages 5–32 years. Four were Indian, one Nepali, and twenty-five Tibetan. Students' socioeconomic backgrounds varied, with most coming from families living in poverty: some with single or divorced parents or with numerous siblings that compromised family ability to provide for the child with disabilities. Fifteen students had resided at Karuna Home for 5 to 8 years, and fifteen had been there for 1 to 4 years. Students attended classes based on ability level and behavior, including five students in Sunshine class (highest ability), six in Rainbow class, eleven in Lotus class, and eight in Sensory class (lowest ability).

Procedures

Data were collected through interviews, observations, and document review. Interviews were conducted in various classrooms and offices using a protocol based on McCracken (1988), with broad open-ended questions allowing respondents to relate their experiences in their own ways, supported by planned prompts. Observations were conducted in each of the classrooms, the dining hall, the physiotherapy room, and the community using both paper and computer to note procedures and interactions. Documents were reviewed for history and statistics, and anecdotal notes were recorded in a field journal.

Interview procedures

The interview protocol included 10 questions, each with three to six planned prompts to enhance descriptions. For example, for the question “*What is the process for admitting new students to Karuna?*” four prompts were planned:

- (1) Can you describe the admissions process?
- (2) Can families contact the home to request enrollment?
- (3) What instruments, if any, are used to determine eligibility?
- (4) Is there a fee for a student to be admitted?

After explaining the interview purpose, the researcher invited each informant to read and sign a consent form, then presented questions and prompts, audio recording the interviews. Informants were interviewed once or twice for up to 32 minutes each session and contacted later to clarify responses as needed. Informant time commitment did not exceed 90 minutes.

Observation Procedures

The researcher observed in classrooms and other school and campus areas to identify specific administrator and teacher strategies for assessment, planning, and instruction, as well as procedures for managing student behavior and school routines. The observer recorded data on an observation form or laptop computer in each setting. The form included the date, setting, teacher, observer, students, materials, and lesson objective. The observer also recorded information on the elements of instruction observed: for example, opening, instructional strategies, student response formats, assessment, closing, and behavior management strategies.

Document Review Procedures

The researcher reviewed documents and recorded data pertaining to the founding of the center as well as its mission, administrative policies, governance, and admissions. Data included Karuna Home history, student demographics, student academic and behavioral levels, intended learning outcomes, assessment results, service provider training, and other pertinent information. The researcher used a computer to table demographic information for all students while viewing files or documents posted in classrooms. The researcher also made anecdotal notes from documents and posters throughout the facility listing Karuna’s mission and policies.

Data Analysis

Audio-taped interviews were transcribed, then analyzed using Nvivo 10, a software program for sorting and organizing interview data for thematic analysis (QSR International, 2010). With Nvivo 10, data were coded and independently organized into themes using a six-step inductive approach described by Braun and Clark (2006): (a) become familiar with the data, (b) generate initial codes, (c) search for themes, (d) review themes, (e) define and name themes, and (f) produce the report.

Findings

Karuna Home was established in 2004 to address the needs of individuals with disabilities within the construct of Tibetan Buddhist theology. Providing for the needs of individuals with disabilities and their families is congruent with the religious and ethical standards of the Tibetans in exile. Wangmo’s (2011) assertion that religion helps people understand their condition in this life and improves their mental, physical, and spiritual health is reflected in informants’ statements that Karuna Home helps students who cannot help themselves and prepares them to live meaningful lives.

Construction on Karuna Home began on 15 August 2001 and was completed on 3 December 2004, one day before inauguration by the Dalai Lama. The campus has an office, fish pond, physiotherapy room, medical block, three classrooms, a sensory room/classroom, kitchen, cafeteria, four dormitories, two guest houses, two staff houses, and a house for the principal, his family, and the assistant principal. Construction for new prayer rooms and other buildings began in June 2012. All staff members live at Karuna Home, except for two or three who commute.

Purposes

Informants reported the motivation and purpose of Karuna Home as addressing a Tibetan community and worldwide need to show compassion to all, especially those who suffer. *Karuna* is Sanskrit for compassion. The principal-founder described three main purposes: (1) to raise living standards for the

residents with disabilities, including food, cleanliness, healthcare, and shelter; (2) to provide education; and (3) to help residents with disabilities become more independent.

Counsel of the Dalai Lama heard by the principal as a youth instilled in him a feeling of responsibility to “help the poor people and do more social work.” Since adolescence the principal has desired to be involved in social work. He once witnessed a Tibetan farming family tying a child with a disability to a tree whenever they left home for work or leisure, and he felt like the child was being “treated like a dog.” This sparked his desire to create a home for people with disabilities. In searching for potential residents of Karuna Home, the principal was shocked to discover so many with disabilities who were unknown to the community, as most people with disabilities never leave home. Scheidegger et al. (2010) noted conditions that substantiate the principal’s report of limited community opportunities for children with disabilities.

Students

Karuna Home admits four to five students each year at no cost, based on need. Costs are paid by donors, called “sponsors” by Karuna staff. The principal identified the first students using a list provided by the Tibetan Government in Exile Central Administration to locate seven children in south India. The following year nearby families asked to have their children admitted, and subsequently admissions have been based largely on request.

Admission Decisions

When admission is requested, the administration investigates the family’s background, completes home visits, and makes the final decision. Selection factors include Karuna resources, family economic status, and parent age. Resource availability was the main purpose reported for careful student selection: a ratio of severe disability to mild disability cases appropriate for the available staff and resources. After a family’s financial need has been determined, a visiting professional physiotherapist from Italy completes a physical examination and determines the severity of disability. Admission is prioritized for families living in poverty and for young couples just beginning life together. Children of young couples are admitted until the parents can, as stated by the principal, “stand on their own two feet,” at which point the child returns to the parents. There is a waiting list for later admission as resources permit.

All informants reported that families visit their children throughout the year and during the two-month school holiday. Many parents visit on second Saturdays and major holidays, and some take their children home during holidays. When asked if a child could be adopted, the principal responded that all the children have families in India, but outsiders could volunteer to sponsor a child.

Language and Family Backgrounds

Nearly all informants claimed that Karuna students speak Tibetan but use English during English instruction. The Indian students appear to have the most severe disabilities, and many cannot speak any language. However, one informant reported that these students usually understand Tibetan because caretakers and teachers use primarily Tibetan when communicating with them.

Most of the students were raised in India, although a few came directly from Tibet or Nepal. Most parents live in poverty because they have several children, earn little income, are single or older parents, are unable to work, or are young parents just starting out. Indian and Tibetan cultures typically emphasize family responsibility for these children using only the resources afforded by the family’s income, without government help or social programs (Murdick et al., 2004; Scheidegger et al., 2010).

Sociocultural Aspects

Attitudes and perceptions about disability vary significantly among the administrators and service providers, yet the individuals are consistently positive in their conduct and treatment of students. Many in the larger Bylakuppe community fear people with disabilities, but several informants commented that the work at Karuna Home is good and noble, which is likely related to their Buddhist beliefs. Service providers reported several different attitudes affecting their choice to work in special education, their perceptions of disability (including causes), and their religion related to disability.

Attitude toward Service

Reasons for joining Karuna Home included convenience, duty, compassion, social encouragement and acceptance, inability to obtain a general education position, and a general desire to work with individuals with disabilities. Chodren, the special educator, described a strong feeling of responsibility to serve

Tibetan society and individuals with disabilities influenced by a film about Helen Keller at a pivotal moment in her life. Champo, the social science teacher, described his life as “pointless” before coming to Karuna, explaining the positive meaning that working there has brought to him. Sangmu, Tsewang, Gyaltsen, and Dawa were all unable to find general education positions, and family members or friends referred them to Karuna Home. All of them enjoy working with the students, despite having experienced difficulties from lack of training with students with disabilities.

Causes of Disability

Most informants said they consider parents as primarily to blame for their child’s disability due to choices parents made during pregnancy or birth: ingesting harmful substances, failing to get adequate healthcare, etc. Two participants blamed genetics for disability, and two noted karma or fate as the cause. One informant referred to disability as “disease,” possibly reflecting a negative cultural perception.

Karma and Disability

Karma was explained by one informant as basically the law of cause and effect in which reincarnation is influenced by positive and negative actions that determine suffering in this life or the next. Most informants considered disability related to Karma—some believing in a stronger relationship than others. Some believed that treating students with compassion and kindness would increase the likelihood of a better rebirth. Despite the reported connections between disability and karma, all informants reported that service providers treat the students with respect, love, and kindness—consistent with the researcher’s observations over the three-month period of data collection. Champo said regarding karma and disability,

In Buddhism we believe [in karma] . . . but [a] helping hand is more important than praying hands, so we . . . need to help the . . . people with disabilities. . . . Thousands and thousands of [words of] Buddhist text means “help others.”

The Role of Religion

Religion seemed to enhance the educational environment in general. Informants reported that Buddhism has the potential to enrich lives, whether through joining morning prayers, visiting local monasteries, or learning life lessons; but each person chooses whether or not to participate. The strict practice of Buddhism—or any religion—is not required at Karuna. Most of the adults are Buddhist, with the exception of a few of the Indians and Tibetans, and all have equal choice to practice. Morning prayers are mandatory for the students, but personal practice of religion is optional. Several students with milder disabilities recite prayers, and most students engage in prostrations regardless of disability level. Personal study, staff meditation, and other optional spiritual practices occur regularly. Additionally, the staff and students often visit local monasteries privately or in groups for outings or religious events.

Dachen, the Tibetan physiotherapist, noted that even the most severe students can still experience “enlightenment” from “just hearing the basic prayers.” Champo elaborated,

I don’t go often to the prayers. But I think [for] every Tibetan especially, the religion plays a very important role in our daily lives because . . . some kind of creed Buddhist is written deep inside within your heart that you feel sometimes compassionate. . . . It suddenly comes, you don’t have to practice . . . but it suddenly comes, so this religion plays a really important role in our lives. We have in Buddhism [a] belief that if you hear some prayers, that will benefit, not in this life, but to other life.

In the literature, perceptions about disability have been noted to affect service providers’ conduct toward their clients and families’ treatment of their children (Arajoo, 2009; Ault, 2010; Edwardraj, Mumtaz, Prasad, Kuruvilla, & Jacob 2010; Ekas, Whitman, & Shivers, 2008). Vakil et al. (2002) reported that a private school for individuals with disabilities operates on the belief that those with intellectual disabilities can take an active role in society as productive and capable people. The school designed and implemented a vocational curriculum to ensure that students leave the school with skills to enter the community in some meaningful way. Similarly, religious understandings about disability can be sources of support when working with this population (Ault, 2010; Edwardraj et al., 2010; Wangmo, 2011), positively affecting the way teachers plan, instruct, and interact with students and coworkers. This proved true during observations at Karuna Home. The principal explained how love and compassion affect the relationships between teachers and their students:

At the beginning some of them . . . when [they] see the different kinds of disability children, they are a little bit afraid. Nervous too. But very soon they integrate and they accept it . . . because of our religion—the Buddhist love and compassion. I think this is root of our tradition.

Chodren explained that she does not consider her students to be disabled and does not use the prefix *dis*—only *ability*. While she realizes her students can be at a great disadvantage educationally, she places greatest emphasis on their abilities and celebrates the small strides they make:

If we put *disability*, these negative words could hurt the children. I think about their ability while working with them. If I teach one fruit, I have to teach it 100 times. I teach pomegranate, pomegranate, pomegranate. It takes the children time but they get it at a later time, so I then focus on their ability rather than the *dis* hurtful part.

Chodren named her class *Lotus* because she sees the students as lotus flowers. Even though the plants are rooted in the muddy bottom of a lake, Chodren noted that when they rise to the surface they become beautiful flowers:

Lotus symbolizes our special children like the opening of the each petal from the lotus. [In the] same way they are being lifted up from the darkness, and we give special education to open up their capacities to improve skills for their daily living. [We] hope that they will . . . blossom like the lotus.

Educational Aspects

The students' disabilities are physical or cognitive or both, including Down syndrome, several types of cerebral palsy, autism, mental retardation, blindness, multiple disabilities, dyslexia and other learning disabilities, muscular dystrophy, microcephaly, psychological disorders, speech impairment, and epilepsy. Additionally, many students engage in behavior that affects academic achievement and behavioral progress: for example, aggression, defiance, disruptive behavior, attention deficits, and echolalia. Determining strategies to meet behavioral needs was usually difficult and unsuccessful because most staff members lacked training in behavior analysis and management. Several informants agreed that most disabilities are severe, with a few in the mild-moderate range.

Diagnosis and Placement

Initial diagnoses and determination of academic achievement and functional performance levels are completed in varied ways. Most students new to Karuna Home arrive without diagnoses, having rarely, if ever, seen a doctor. For these students, diagnoses are determined primarily by the Italian doctor with opinions from local Tibetan doctors. Students' physical disabilities (e.g., cerebral palsy) must be diagnosed by the physiotherapist. The only teacher with training in behavior disorders has not been trained in diagnosis.

Upon arrival, almost all students spend time in the Lotus class while teachers observe to determine entering levels of ability. When asked how teachers determine class placement, informants explained that placement depends on students' spoken language and physical fitness. One teacher claimed new students remain in the Lotus class for two days, but others reported at least two weeks. After the initial time in Lotus class, the teachers consider the students' cognitive and physical disabilities and behavior as they make placement decisions. A student with a very severe disability (unable to speak, walk, or move) is placed in the Sensory class.

Placements are a continuum within which students can move depending on abilities and monthly progress. Observations indicated that classroom placement is based not only on levels of academic ability and functional performance, but also on available resources. For example, two students with Down syndrome attended classes lower than their ability for one class period each day where they acted as peer tutors.

Interview data established that students' disabilities significantly affect learning and behavior. Examples by informants include inability to pay attention or remain calm enabling others to learn; anger and aggression caused by inability to communicate or frustration at decline in physical ability; poor motor skills for grasping or writing; imitation of inappropriate behavior instead of target behavior; "beating" and other violence; lack of progress for the hearing impaired because they lack sign language; and

echolalia in place of meaningful speech. Informants reported that seven or eight students had attempted to attend the local school but were unsuccessful and rejected.

Intended Student Learning Outcomes

Interviews, observations, and document review consistently showed that learning and behavioral objectives are intended to help students become more independent and academically proficient. This evidence also revealed that teachers usually did not reference a special needs curriculum or disability-friendly standardized curriculum when creating objectives. Research indicates a lack of core curriculum for students with disabilities in India (Mumbai, Delhi, Kolkata, & Rao, 2011; Singal 2006; Singh, 2004; Vakil et al., 2002), and this was the case at Karuna.

As each new session begins, the staff meets to collaboratively create objectives for students' progress in academics, daily living skills, behavior, and physiotherapy, based primarily on observed levels of students' performance and limited textbook curriculum. Most informants review objectives for students each day they teach. One teacher explained that the three different student levels in her Sunshine class required her to create three separate lesson plans daily. Originally, teachers created one objective in each subject for each class. They discovered within the first three years that student differences made this ineffective. After advice and training by experienced volunteers, the teachers, caregivers, and physiotherapists began to create 5-15 individual objectives that are evaluated every six months during a progress meeting with all staff members. Research indicates that a formal curriculum for students with disabilities is lacking in India (Mumbai et al., 2011; Singal 2006; Singh, 2004; Vakil et al., 2002) and this was the case at Karuna. Karuna objectives tend to be very general, and many can be used for several students, but they are difficult to measure. All informants expressed a desire to learn to create measurable learning and behavioral objectives.

Assessment, Curriculum, and Instruction

Physiotherapists, caretakers, teachers, administrators, and sometimes nurses have been involved in assessment, curriculum planning, and instruction. Assessment has been sporadic and uninformative, with curriculum primarily based on academics in local schools and daily living skills deemed most appropriate by the staff. No formative assessment of progress toward objectives has been in place, aside from teacher observations and written tests at the end of the term. Data-based instruction involves decision making based on evaluation of formative and summative written, oral, and performance tasks or on standardized assessments (Ediger, 2010). Academic and behavioral data help teachers evaluate instructional effectiveness and thereafter make informed decisions to address student needs (Flowers & Carpenter, 2009; Kiker, 2009). Lack of current-level data at Karuna certainly hindered the instructional planning and decision making processes. Interviews, observations, and document review revealed that teachers had little concept of the nature and value of ongoing curriculum-based measurement, particularly its role in improving curriculum and instruction. The lack of organized assessment and ongoing measurement created problems when staff attempted to plan instruction and report student progress. Without clear data about where to begin instruction, teachers simply estimated ability, wrote learning objectives that "might work," and adjusted objectives in a sort of trial-and-error process. The staff expressed difficulty in measuring academic success due to the lack of assessment skills. Determining present levels of achievement and performance for higher functioning students seemed arbitrary and was not perceived by informants as a good use of time. Accurately assessing lower-functioning students was reported as a significant need by informants and noted also by the researcher. Additionally, the principal noted that living with the students can make it difficult to assess them objectively. He said,

When you live inside here with them . . . you are never satisfied. You want them to achieve more and more. . . . But when after staying here ten and a half months they go back with their parents one and a half months, their parents tell me they are [a] *lot* improved, so I feel very proud and happy.

Interview and observation data confirmed a need for professional development in creating measurable goals and objectives for learning and behavior, for assessment and effective instruction, and in more effective use of teachers, assistants, and resources.

Specific Classes

Students are served in one of four classes and many also receive physiotherapy or take part in vocational training. Each class is examined in detail below.

Rainbow and Sunshine Classes. Term exams and a handful of observations constituted the data taken in the Rainbow and Sunshine classes, which include math, English, Tibetan, social science, vocational, dance, and combined instruction. Curriculum is sometimes derived from textbooks, but usually based on teacher opinion. These classes, especially Sunshine, place greater emphasis on academics than functional skills. Students use workbooks, textbooks, and notebooks to complete math problems, copy numbers etc. Some teachers assign scores to students on assignments from workbooks or quizzes from textbooks. English classes include very basic conversational instruction. Rainbow students often simply practice writing their names or important vocabulary words in English, with little time spent speaking. Sunshine students read, write, and speak in English and Tibetan, and this class had the most noticeable success, with written exams from which scores were calculated, posted, and noted as measurably improved. Students were rewarded by seeing their scores.

Lotus Class. After dozens of observations, the researcher concluded that data collection in Lotus class has consisted of occasional informal observations. When asked how they measured progress, teachers referred to tri-monthly student update meetings. In response to the question “How can one tell whether or not an objective has been met?” the teachers reported that observation is the method of choice; however, no substantial record of observation has been kept.

Lotus learning objectives and curriculum are based on what teachers feel helps students increase independence. Curriculum includes learning about body parts, senses, fruits and vegetables, transportation vehicles, colors, and staff names; activities include drawing, arts and crafts, storytelling, and social skills. Additionally, a posted schedule listed language and communication, sensory stimulation, speech, oral massage, and recreational activities. Explicit instruction for language and communication was not observed.

Sensory Class. Sensory students have the most severe disabilities; thus progress is difficult to measure without creatively and masterfully individualizing assessments. Teachers reported needs for new assessments and curriculum. Student progress is assessed by the physiotherapists through observation. Sensory students spend half of the first hour of the school day in physiotherapy and the second half in Lotus class. Afterward at least two teachers help them in meeting physiotherapy goals or in using and understanding their senses. The teachers indicated that they did not work on communication or functional skills, and they felt frustrated in determining appropriate curriculum and instruction. The teacher to student ratio ranged from 1:3 to 1:4.

The adults and other students obviously cherish the Sensory students. Students from other classes consistently contribute to their care by pushing them in wheelchairs, swabbing their mouths when they salivate, and including them in activities.

Physiotherapy. Physiotherapy was an observed strength and works well at Karuna. Its success may result from personnel preparation and confidence in their duties, from the 1:1 student-staff ratio, and from the belief that physiotherapy is something the students can “actually do,” a phrase used several times by informants. The physiotherapist and his assistants record student progress and skill maintenance daily on a data sheet, including whether or not the student completed each task required: stretching upper and lower limbs, strengthening upper and lower limbs, stimulating senses, working on balance, or walking over obstacles. The physiotherapist is highly trained, the schedule is established, students and teachers are comfortable with it, and assistants and caretakers know what to do. Formal and informal observations consistently found all staff engaged with students during physiotherapy.

Vocational Class. Higher level students from all classes seem highly motivated to participate in vocational classes taught by the special educator each Saturday, with activities such as using money, making crafts to sell, and cooking and selling food and tea. Teachers approach vocational classes seriously, investing more time and preparation than for routine daily instruction. As she was observed throughout a week, Chodren spent extra time preparing to teach a vocational lesson to a small group of higher functioning students, conversing with her coworkers and the researchers with a level of excitement not apparent during her daily instruction.

Community Outings

Vocational classes and community outings were successful aspects of the educational program, consistent with research findings regarding successful special education in India (Vakil et al., 2002). All

informants affirmed that all students participate in community outings to learn and practice functional skills such as navigating safely through the community, eating appropriately at restaurants, worshipping in the temples, using money, making purchases, and participating in leisure activities. Staff members rotate the responsibility for taking different student groups out each Wednesday: small groups of students in each of the first three weeks, and a combined outing the fourth week with all students attending, including those with the most severe disabilities. On fourth Wednesdays the staff pack two vehicles with students and adults until there is little room to breathe or think, and drive through the camps with the windows down, blaring the latest Tibetan pop music with everyone singing to their hearts' content.

Students also go into the community to perform for the public and for sponsors visiting from "outside." One memorable experience was the celebration of the birthday of His Holiness the Dalai Lama, at which the students performed Tibetan songs and dances for thousands of viewers. The English teacher explained that performances at Tibetan community functions are frequent, as are prayers at the local Buddhist monasteries. One informant expressed concern that community members were still disturbed by public appearances of Karuna students, "which is a part of Tibetan society in need of improvement." Thus community outings familiarize the public with this diversity in their culture.

Collaboration

Every Thursday from 4:00 to 4:30 the teachers and necessary staff meet to discuss student academic progress and behavioral problems along with other issues raised by individual teachers. After a problem has been described in detail, they develop a strategy to address it. After applying the strategy, the implementer returns with a status update, and changes are made if needed. In addition to the Thursday meetings, three types of major meetings are scheduled during the school year: student update meetings (every three months), student progress meetings (twice per school year), and general meetings (twice per year).

Service Providers' Training and Experience

Training and experience vary greatly among Karuna service providers, especially the teachers. All teachers have earned at least a bachelor's degree or a teacher training certificate. Two teachers, who were in their fifth month of teaching at the end of the study, had not previously worked with people with disabilities. Champo had attended a 12-week certificate course in Mumbai called "Community Initiatives in Inclusion," which taught participants to plan, manage, and train others to provide inclusive community services for people with disabilities. Those teachers who completed a teacher training course had a few classes on student psychology and also participated in workshops taught by volunteers who visit Karuna Home throughout the year. A teacher who completed a three-month course on behavior gives regular behavioral advice to the other teachers.

Some teachers have been at Karuna Home for up to four years. Only one teacher had teaching experience prior to joining Karuna Home; that experience was teaching secondary school. The administrators have both earned PhDs, one teacher has her master's degree, and one teacher has her special education degree. The physiotherapist has a bachelor's degree in physiotherapy, and his assistants have only the training they received at Karuna Home.

Professional development is provided primarily by two or three volunteers each year and by the special educator. Training courses are available in other parts of India. Health care training is provided by the two certified Karuna nurses.

Limitations

This study is limited in its scope due to the single case of Karuna Home, the validity and reliability of the instruments, and the language differences. Karuna Home was chosen for the study because it is the only center of its kind in India and was of interest to the authors because of their work in another program for individuals with disabilities in India. The interview protocol and observation forms were created by the researcher according to guidelines suggested by McCracken (1988), but they were not tested for reliability or validity prior to the study. Language barriers sometimes made it difficult for the researcher to conduct optimal observations and interviews, as most instruction was in Tibetan and interviews were conducted primarily in English. Both of these data sources required translation, which can cause information to be misconstrued. Informants sometimes had difficulty understanding the questions due to either language barriers or lack of training in education and related vocabulary (e.g., curriculum, assessment, and instruction). A potential limitation was the staff's desire to give "correct" or

“appropriate” responses during interviews; however, observations over a three-month period confirmed that responses were consistent with actions in and out of the classrooms.

Future Research

This initial case study establishes groundwork for future research addressing the needs of the Karuna Home educational program. Ongoing teacher development has long been an accepted practice for improving teaching and learning (Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). However, critics of teacher development argue that teacher practice seldom changes as a result of inservice education (Fullan, 2007; Guskey, 2003). Therefore, Karuna and similar programs would benefit from controlled studies of teacher development for planning, instruction, and progress monitoring, as well as studies of teacher implementation and fidelity of practice. Similarly, studies comparing the effectiveness of instructional and behavioral strategies would be helpful. Descriptive cases of residential schools for other unique populations could add significantly to the research base. All research should be designed and implemented with sensitivity to social and educational culture.

Conclusion

This study indicates that Karuna administrators, teachers, and other caretakers feel love and compassion for the students consistent with Buddhist beliefs, and that some are more confident than others regarding the students’ potential for improvement. The study also establishes the need for Karuna to adopt curricula to address the various levels of student needs, supported by school-wide systematic procedures for accurately assessing students’ academic and behavioral functioning and for monitoring progress during instruction and therapy. Byrd’s (2010) study of a successful nonresidential private school in India found that having a staff of trained special educators contributed greatly to the school’s success. Karuna teachers would benefit from professional development centered on the use of data to create learning objectives, to monitor progress to determine effectiveness of instruction, and to improve instructional practice. In turn, students could be expected to benefit as staff and instructors use data to plan instruction and to measure progress toward mastery.

Others can benefit from this study when creating a program serving individuals with disabilities in comparable circumstances. Results can help practitioners evaluate professional practice and determine needs for additional development and training. Practitioners can benefit by considering fundamental aspects of the processes and factors affecting success at Karuna Home, including the mission and aims, resources, curriculum, assessment, learning objectives, instruction, collaboration, and professional development.

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EFFECTIVENESS OF FAMILY, CHILD, AND FAMILY-CHILD BASED INTERVENTION ON ADHD SYMPTOMS OF STUDENTS WITH DISABILITIES

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The aim of the present study was to investigate and compare the effectiveness of family, child, and family-child based intervention on the rate of ADHD symptoms in third grade students. The population for this study was all of students with ADHD diagnoses in the city of Isfahan, Iran. The multistage random sampling method was used to select the 60 subjects included in this study. The subjects were randomly assigned into four groups, including three experimental and one control groups (each group consisted of 15 students). The children had been diagnosed by clinicians as having ADHD. In order to verify this diagnosis, Conner's parental rating scale was used at baseline to confirm that children had ADHD. The results of the post test indicated a significant difference between the four groups. The results showed that the family-child based intervention was the most effective method to decrease students' ADHD symptoms.

Introduction

The Attention Deficit/ Hyperactivity Disorder, (ADHD), is a sustainable pattern of lack of attention, hyperactivity and impulsive behaviors which are more severe and prevalent than the behaviour of the children without ADHD at a similar developmental level. In order to diagnose ADHD, some symptoms would appear before the age of seven; although most of the cases are diagnosed years after its appearance (Kaplan & Sadock, 2000). Recently, the requirement of proven impairment before the age of seven has been challenged and modifications to better address the issue in the upcoming Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-V; American Psychiatric Association, 2000) criteria have been suggested (Bell, 2011). ADHD is one of the most common childhood neurodevelopmental disorders, affecting three to seven percent of school-aged children, with diagnosis more common in boys (5th ed.; DSM-V; American Psychiatric Association, 2000; Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007).

The basic symptom domains of ADHD, as defined by the diagnostic classification systems, are hyperactivity, impulsivity, and inattention. Empirically, ADHD is not limited to the basic symptoms but can be associated with cognitive deficits (Frazier, Demaree, & Youngstrom, 2004; Hervey, Epstein & Curry, 2004) and functional impairment in various life domains (e.g., Biederman et al., 1998, 2006). For example, ADHD is related to academic underachievement (Biederman et al., 2008; Roy-Byrne et al., 1997), and individuals with ADHD often have a history of school problems that cannot be explained by learning disabilities (Seidman, Biederman, Weber, Hatch, & Faraone, 1998).

Every culture has children with ADHD (Barkley, Cook & Jr. Diamond, 2002). Ross (1987) found that classrooms in Thailand have comparatively fewer students with ADHD because children are expected and trained to behave and talk quietly in public in Thailand (Moon, 2011).

Likewise, East Asian countries have lower rates of ADHD diagnosis, mainly due to their cultural background, Confucianism. East Asian societies highly value education, harmony with others, and loyalty to the country, parents, and elders. The cultural environment of East Asian countries contributes to having fewer students with ADHD and different concerns in the classroom setting when compared to US classrooms (Moon, 2011). In addition, there is some evidence suggesting that cultural factors may modulate the clinical manifestation of disruptive behavior disorders and ADHD (Livingston 1999;

Reid, 1995). According to Batchelder (2003), social and cultural factors are keys to understanding trends in ADHD diagnosis and methylphenidate treatment (Moon, 2011).

Primary therapies emphasize medication and behavior therapy (Chronis, Jones, & Raggi, 2006). However, cognitive, behavioral-cognitive and neuro-cognitive interventions are being continued to be as other options for therapy (Barkley, 2006). In another category, these therapeutic approaches can be in the form of peers, classmates, school based, family based and child based interventions. Generally, helping these children who suffer from ADHD requires a comprehensive therapeutic method which is called a multi-pattern therapy which includes parents and child training, behavior management, usage of stimulant drugs, scheduling and suitable institutional supports (Behboudi, 2007).

Since behaviors of children with ADHD often damage parent-child relationship and increase stress among parents (Johnston & Mash, 2001), a part of therapy would be the direct working with parents in order to modify their child rearing style in order to increase positive consequences for their children (Pelham, Wheeler, & Chronis, 1998). Parent training is more common than other family interventions. Barkley (2001) points out parental need for behavior management in treatment of children with ADHD. According to a meta-analysis study carried out by Fabiano, Pelham, Coles and Gnary (2009), 174 studies where the results indicated that behavior therapy was very effective in dealing with ADHD. Macford and Barlow (2004) did a qualitative study in which the effects of parental training were examined. The participants, who all were mothers, have reported an increase in their feeling of sufficiency, the decrease in psychic tension and increase in child obedience. Results from one study done by Hooshvar, Behnia, Khooshabi, Mirzaei and Rahgozar, (2009) also suggested that parents' group training, concomitant with medication and occupational therapy programs, can play an outstanding role in decreasing harassing behavior problems, anxiety problems and hyperactivity. Hajebi, Hakim Shooshtari and Khajoddin (2005) found that teaching behavioral management to parents leads to the decrement of ADHD symptoms in their children.

In a meta-analysis done by Farmer, Compton, Burns and Robertson (2002) the efficacy of family based intervention was investigated. The result showed that family based intervention decreased ADHD symptoms. Kazdin (2001) showed that family based and child based interventions had a good impact on decreasing ADHD symptoms. With regard to the results of these studies, the aim of this study is to compare the efficacy of family based, child based and family-child based interventions on the rate of ADHD symptoms of third grade students' ADHD symptoms. Although, this research is repeated research but, it has been done in Iranian society, city of Isfahan (with more than two millions population). This research is done for the first time in Iran (city of Isfahan).

Method

The statistical population of this study included all nine years old third grade elementary male students with ADHD in Isfahan city, Iran. The sample of this study included 60 third grade elementary male students with ADHD. A multistage random cluster sampling method was used to select subjects, of six educational areas of Isfahan city and two areas were randomly selected. Then of these two areas 13 schools were randomly selected. Finally of these 13 schools, 60 male students with ADHD were randomly selected. These students were randomly assigned into four groups (three experimental groups and one control group, each group included 15 students).

The following criteria were considered for samples in order to enter the research: 1. no intellectual disability; 2. having no specific and clear disorder except ADHD; and 3. parents' written consent for their children's participation.

Research Method

After schools were randomly selected, Conner's parental questionnaire (2001) was distributed among parents of students. Then, 60 students, identified as having ADHD by parents and professional, were assigned into four groups (each group with 15 students- three experimental and one control groups). These three experimental groups received family based, child based and family-child based interventions. The family based intervention according to Barkley program (Carr, 1999) and child based intervention including attention training, memory training, mind-body integration training and eye movement training (Moor & Fallah, 2001) were given to the experimental groups. For experimental groups, 30 training sessions (10 sessions of child based intervention, 10 sessions of family based and 10 sessions of family-child based) were used (each session continued for 60 minutes). At the end of

training sessions, Conner's parental questionnaire was again administered to the experimental and control groups as post-test.

Instruments

In this research, Conner's rating scale was given to parents in order to rate their children's ADHD symptoms. This scale was designed by Conner (2001) and consists of 27 items. The scale is designed to measure the intensity of ADHD symptoms. Conner's scale is one of the most well-known instruments for assessing of ADHD which is used by various researchers. Family based intervention, child based intervention, and family- child based intervention were the independent variables.

Results

The results of ANCOVA analysis regarding the effect of child based, family based and family- child based interventions on the rate of ADHD symptoms are presented in Table 2. In this analysis, the effect of pre-test was controlled. Descriptive data are presented in Table 1.

Table 1. Mean and Standard Deviation Scores of Pre and Post ADHD Symptoms in Experimental and Control Groups

Group		pretest		posttest	
mean	SD	mean	SD		
44.80	3.23	39.86	2.77		
45.20	4.19	36.40	3.06		
43.06	3.88	35.06	4.14		
45.40	2.64	46.46	4.29		

As Table 1 shows, the post test scores for ADHD symptoms have been decreased for the experimental groups as well as the control group.

Table 2. The Results of ANCOVA with Respect to Differences of Four Groups

Sources	df	Mean square	F	Sig	Eta ²	Observed power
Pretest	1	48.02	3.82	.5	.06	
Group	3	353.68	28.19	.001	.60	.48
Error	55	12.54	-	-	-	1

Results of Table 2 display a significant statistical difference between child based, family based and family-child based interventions and control group in relation to ADHD symptoms ($P < 0.000$). The amount of training effect is 60% and the observed power shows that the volume of sample was adequate.

Discussion

The results of the study indicated that there is a significant difference between family based, child based and family-child based interventions among experimental groups and these experimental groups and control group as well.

In other words, these interventions in randomly assigned experimental groups as compared to control group decreased ADHD symptoms. The findings are consistent with studies of Macford and Barlow (2004), Mac- Mahon and Forhand (2003), Hooshvar et al., (2009), Hajebi et al., (2004), Farmer et al., (2002), Kazdin (2001), Froelich et al., (2002). Moreover, the results of the Tukey test showed that the most effective method was family-based intervention. To explain the results of the present study it could

be stated that the parents as the closest ones to the children play an important role in training and learning of children. Parents' training can decrease stress and tension of parents which leads to improvement of proper parent child relationship. This in turn leads to parents' understanding of their children's needs. Regarding the effectiveness of family-child based intervention, it seems clear that this type of intervention is significantly effective for parents who are still not ready to accept their children's problems. Since children are impressed by environment, especially by parents, therefore, parent training is an appropriate opportunity for parents to intervene their children's behavioral problems.

Table 3. Tukey Test, Comparison of Mean Scores of ADHD Symptoms in Experimental and Control Groups

Group I	Group J	Mean Difference (I-J)	Sig
Child based	Family based	3.46	0.05
	Family- child based	4.80	0.01
	Control	-6.60	0.01
family based	Child based	-3.64	0.05
	Family- child based	1.33	0.74
	Control	-10.06	0,01
family- child based	Child based	-4.80	0.01
	Family- child based	-1.33	0.74
	Control	-11.40	0.01
Control	Child based	6.60	0.01
	Family based	10.06	0.01
	Family- child based	11.40	0.01

The results of Table 3 display a significant difference between family based, child based and family-child based interventions and control group. Moreover, the results showed that among intervention methods, the most effective are the family based and family- child based intervention.

In other words, these interventions in randomly assigned experimental groups as compared to control group decreased ADHD symptoms. The findings are consistent with studies of Macford and Barlow (2004), Mac- Mahon and Forhand (2003), Hooshvar et al., (2009), Hajebi et al., (2004), Farmer et al., (2002), Kazdin (2001), Froelich et al., (2002). Moreover, the results of the Tukey test showed that the most effective method was family-based intervention. To explain the results of the present study it could be stated that the parents as the closest ones to the children play an important role in training and learning of children. Parents' training can decrease stress and tension of parents which leads to improvement of proper parent child relationship. This in turn leads to parents' understanding of their children's needs.

Regarding the effectiveness of family-child based intervention, it seems clear that this type of intervention is significantly effective for parents who are still not ready to accept their children's problems. Since children are impressed by environment, especially by parents, therefore, parent training is an appropriate opportunity for parents to intervene their children's behavioral problems.

In summary, family-child based intervention, on one hand helps the child control, his behavior and on the other hand helps parents comprehend how to behave with their child. Therefore, both of these elements help improve child's ADHD symptoms. It is suggested that in future research, this comparison be done in other students with different grade levels.

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INCLUSIVE EDUCATION AND PERCEPTIONS OF LEARNING FACILITATORS OF CHILDREN WITH SPECIAL NEEDS IN A SCHOOL IN SWEDEN

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This study examines the concept of inclusion and the degree to which it is being practiced in Swedish municipality schools and tries to draw some conclusions about the nature of pedagogy practiced in Sweden. This is a qualitative case study where primary data are collected from only five facilitators of children of special needs in one school in Sweden. Data were collected with an open-ended questionnaire, the variations in their responses are considered valuable in order to get a more accurate and comprehensive understanding of the phenomena under study. Perceptions of the respondents indicate that they were participating in both organizational and pedagogic differentiation. The administrators were more vocal about the value of the segregated education. Integration was perceived as being the ideal because it made it possible to both compensate the child as well as facilitate their involvement in the general class room. Inclusion was seen as a higher form of integration and was associated with capital intensive specialized equipment and materials. Respondents feared that children with special needs would not be able to cope with the general curriculum in an inclusive educational situation. I conclude in this study that every fifth student in the middle school in Sweden is probably in need of differentiated activities, and there is a need for another form of teaching than what is being currently practiced in Sweden

Introduction

The Salamanca declaration in 1994 with a commitment to Education for all brought the idea of Inclusive education to the forefront of the International scenario. According to the declaration, inclusive education means the inclusion of all children in all class-room and out-of-class room activities, which implies that all children should have equal opportunities to reach their maximum potential and achievement, regardless of their origin and abilities or disabilities, and regardless of their physical, intellectual, social, emotional, or linguistic differences. The declaration also states that those with special educational needs should have access to regular schools, which should accommodate them within a child-centered pedagogy capable of meeting these needs. Schools with inclusive orientation are expected to fight discriminatory attitudes and contribute to the development of positive communities and inclusive societies (UNESCO, 1994: viii - ix). This declaration calls for innovative education and a new thinking in special needs education, which include training educational personnel for enhancing competence. Hence inclusion is to be understood as a process of decreasing exclusion and increasing participation. Thus inclusion becomes a general approach and philosophy in education, where teaching practice responds to individual differences of all students.

Theoretically, inclusion is a philosophy that emphasizes the importance of bringing together diverse students, families, educators and community members, in order to create schools and other social institutions that are based on respect, acceptance and belonging. Inclusive education recognizes that all students are learners who benefit from a challenging, meaningful, appropriate curriculum. This implies differentiated instruction techniques that address student's unique strengths and needs. Inclusion seeks to establish collaborative, supportive, and nurturing communities of learners that are based on giving all learners the services and accommodations they need to succeed, as well as respecting and learning from each other's individual differences (Salend, 2005:6).

Although this study on inclusion is focused on individuals with disabilities, in a wider socio-cultural sense, it is hoped that the educational system would expand to accommodate and respond to the diverse

needs, abilities, strengths and experiences of all students, irrespective of class, culture, ethnicity, and gender. In the context of students with special needs, the inclusive model is one where all students irrespective of their abilities and disabilities spend most of their time together.

Fully inclusive schools are rare. In practice the implementation of inclusive education in schools has mostly resulted in including selected students with mild special needs. In certain small schools run on Maria Montessori's educational philosophies, students with differing physical, intellectual and emotional needs are included in the general class room, in the spirit in which inclusive education was coined. It is my experience during my teaching career in Sweden, that when children with special needs (viz. ADHD, ADD, Asperger's syndrome, and children closer to 70 IQ) are included within the general classrooms of ordinary municipality and private schools in Sweden, the law requires that they are evaluated through the same criteria laid out to children without handicaps. School administrators (mostly traditional and conservative) do not allow perceptive and creative teachers to use compensatory mechanisms to teach and evaluate included students. This leads to repeated failures, distress and low self-esteem on the part of these children.

The concept *inclusive-education* differs from previously held notions of 'integration' and 'mainstreaming', which implies a concern mainly with disability and 'special educational needs' and getting the students to become ready for, and being accommodated by the mainstream education. In contrast to this, inclusion is about the rights of children to participate fully in the general curricular activities of the school, and a respect for their social, civil, and educational rights (Salend, 2005:6).

Significance of the Study

This study addresses issues related to education for students with special needs, and the practice of inclusion in Swedish schools. Inclusive education is an avant-garde and a progressive concept, much debated and examined in Anglo-American and Continental countries. The psychological and social advantage of an inclusive classroom where students of differing abilities and disabilities come together in what is called *En skola för alla* (One School for all) coined in 1980 in Sweden (Lgr, 1980), is clear and laudable. It has become a politico-ideological concept in Sweden, for developing a school that has a high degree of participation, inclusion and integration (Gustavsson, 2002). Field researches show that there is a gap between ideology and practice.

There are both literature to support the advantages of inclusive education as well as ideological and political imperatives to impel exploration of the actual situation of inclusion and inclusive education in the Swedish context. If Sweden is to work towards inclusive education, one needs to document what the nature of the practice of inclusive education in Sweden is. It is vitally important for pedagogues, and for us as a society, to understand the concept of *inclusion* in order to practice it. Cooperation of teachers is critical to the successful execution of inclusive education. Teachers and school administrators' perception and understanding of how to manage children with special needs in a school situation to maximize educational and personality development is important because this influences the quality of the educational process and creation of an inclusive society.

Purpose of the Study

The purpose of this study is partly to undertake a literature study of the concept of inclusive education, and partly to explore how some teachers and school administrators related to one school in Sweden, understand concepts such as segregation, integration and inclusion of children with special needs and their impact.

Research Questions

The questions posed for investigating in this study are:

- a) How do educationists conceptualize the terms *segregation*, *integration* and *inclusion*, in the context of schooling?
- b) What is the perception, attitudes and understanding of segregated, integrated and inclusive education among some teachers and school administrators (the respondents) in a particular municipality in Sweden?
- c) What is the perceived impact of inclusive education as opposed to segregated schooling and integrated schooling according to the respondents?

These research questions were addressed through an open-ended questionnaire appendix (I). The following themes emerged:

- i) Supportive structures for children with special needs.
- ii) Differentiation and special pedagogy
- iii) Understanding of terms *segregation*, *integration* and *inclusion*.
- iv) Need for special programs for children with special needs
- v) The role of special schools and resource-classrooms
- vi) Advantages and disadvantages of segregated, integrated and inclusive education and their impact.

Review of literature

In order to ground the results of this study in theory and research evolved so far, related concepts that inform the notion of inclusive education, are extracted from researches and literature that support the idea of inclusion for children with special needs as well as those that help the author to locate the concept of inclusion in an historical perspective and develop a frame work into which this research on inclusion of children with special needs, can be located.

Mitchell (2004) in an edited book notes that there is a paradigm shift in the conceptualization of education for children of special needs. Inclusive education is a postmodern trend and a progressive evolution in the philosophy of educating children with special needs. Thomas and Loxley (2001) deconstruct special education and constructs inclusion. They note that inclusive education is more than simply integration and that it was about extending comprehensive ideals in education. Concepts such as IQ, intelligence and disability are problematic and essentialist. According to them, disability is a socially contrived construct enforcing social marginalization. Nilholm (2006) problematizes the notion of inclusive education and sees inclusion, integration and segregation as aspects of one process. The concept of inclusion developed within the US as a political-philosophical-democratic perspective, where participation and community are central values. Inclusion was meant to replace prior concepts, such as mainstreaming, that have become watered-down, and implies that pupils should adapt to school settings which really are not adapted to them.

Topping and Maloney (2005) documented that in the previous century, concern about students with serious learning difficulties led to the development of whole industries providing special education in special schools. Segregation in the form of special schools continued without any evidence as to whether students learned more effectively in such settings. They also noted that the later movement of integrating and reintegrating students with learning difficulties into mainstream was based more on ethical considerations rather than functional rationale. Thomas and Vaughan (2004) discussed the political and social context that lie behind the promotion of inclusive education. Inclusion represents the confluence of several streams of thought – social, political as well as educational. Moves to inclusion came from not only research but also from an imperative to greater social justice; from calls for civil rights; from legislation that prohibits discrimination; and from initiatives of imaginative educators. From positions of univocal modernist theories in special education have arisen a multiplicity of positions ranging from advocacy of new approaches to difference based on commitment to principles of equity and inclusion, to deconstructions of special education.

Persson (1998a, 1998b) suggested that special education operates more as a mechanism of differentiation and less as a resource directed to pupils experiencing severe difficulties, and should work inclusively and therefore not be regarded as a system apart from regular education but part of normal educational practice. Andersson and Thorsson (2007) advocated inclusive education for democratic reasons. Their observation of inclusive classrooms shows that there are different ways to implement *En skola för alla* (one school for all). An inclusive education requires changes in attitudes on the part of teachers and administrators and teacher training programs.

Salend (2005) documented research done to examine the impact of inclusion on students with disability, students without disability, educators and families. They concluded that there was a varied impact on students' academic and social performance, and their reaction and attitudes towards inclusion. In general the studies suggest ed that the academic performance of students with disabilities can be increased if they are given appropriate curricular and instructional accommodations within the general educational setting. Studies that examined social, behavioral and self-concept outcomes for students with disabilities in inclusive settings show that, they were better than for those of students educated in non-inclusive settings, although these outcomes lagged behind that of their classmates without disabilities.

Methodology

This study is based on the investigation of a phenomenon called inclusive education. In the process, segregation and integration have also surfaced, and were investigated. It uses investigatory methods such as reading of texts from literature, secondary data and primary data, to bring to surface theoretical understandings of the phenomena inclusive education.

It uses a case study approach. An open-ended questionnaire was constructed to elicit responses from five professionals facilitating educational program for children of special needs. The researcher's ambitions to do ethnography of a Swedish school in order to sift out grounded theory in relation to inclusion of children of special needs was hindered by a cautious but friendly leadership who firmly allowed access to the special education program, in a limited way.

Adjusting to the field contingency, the researcher finally settled for administering a questionnaire to a few teachers and school administrative staff in the special school and those involved in conceptualizing programs for children with special needs. A questionnaire as a tool for collecting data was used because, it allowed the respondents to reflect on the issues involved without pressure, and also allowed to collect the views of the respondents in the language of the respondents, namely Swedish, thus making the data more authentic. It did away with the need to carry complicated equipment such as tape recorders, microphones, etc.

This study is therefore based on readings of texts from literature - secondary data and theoretical conceptualizations, and the texts from primary data. A clear understanding of the grounded reality is expected to emerge from the information collected from the respondents in this case study. A new concept called Gestalt Research was experimented with. It consists of a process where practice leads to theory and research, which in turn leads back to practicing-theorizer or a theorizer-practitioner. An outcome of gestalt research developed two posters and one power point were created by the researcher. In order to make this study feasible (due to the limitations of time) the universe was limited to one municipality in Sweden and to one school (unnamed), that contained within its educational program a special school and resource classrooms. This school also had what they perceived as an inclusive program for children with certain type of special needs such as ADHD, ADD, and Autism.

Ethical Issues

During the researcher's contact with the respondents while collecting data for this essay, the ethical requirements of the ethical council of the Swedish Scientific Council, were observed. Permission from the municipality to do this research in one of their schools was taken, and both the school administrators and the respondents were informed of the aim of this research (requirement for right to information). Participation and cooperation of the respondents was sought on a voluntary basis without any coercion. Several teachers working under pressure refused to spend their time in answering the questionnaire (requirement for assent of respondents). All information regarding the involved persons was treated with the highest possible confidentiality, and care taken to protect the identity of the respondents and students concerned from the public (requirement for confidentiality). The information collected in this research has been used only in this essay and its publication and no other purpose (requirement for the use of information). Since parental assent was required to involve students less than 15 years old, observation and interviews of students were left out of this research.

Research Design

Since this was an exploratory qualitative research, which assumes that the social world is not predictable the research design was highly flexible with regard to experimental, and was made up of individual case studies, where an open-ended questionnaire was used to get a fairly in-depth understanding of the respondents' attitudes towards the concept of inclusive education.

Research Techniques

Several qualitative techniques / tools involving different rationalities were used to collect data:

- a) Case Study - one localized universe was accessed to access in depth the phenomena of inclusion of children of special needs.
- b) Auto ethnography – Information was gathered through the researcher's experiences, impressions and interaction with the school universe.
- c) Questionnaire (open-ended) - was administered to the school administrators and teachers to access their understanding and attitudes towards the concept of inclusion.

- d) Documentary research – was done to fill silent spaces within field data, through use of previously published documents and literature.
- e) Interpretative analysis of the data collected by questionnaires was done.
- f) Gestalt research – feedback was given to the school through circulation of this essay. This is seen as an educative and interactive process of this study. In addition to this two posters (one poster attached, see appendix V) and power point presentations have resulted as an outcome of this study.

Qualitative methodology was implemented in the study, using case study approach (one school in one municipality, as a case) for collecting data, because of the suitability of studying interpretative and subjective aspects of the phenomena inclusive education. In the preparation phase of desk documentary research, numbers of relevant documents related to the legislation of education were read documented and analyzed that will help to fill up silent spaces in the data and results. The author's interaction with the research environment was documented through auto-ethnography, which is a highly personalized text written in active voice. The data were collected by open-ended questionnaires answered in the presence of the researcher to deal with any ambiguities. The qualitative data content (the text) was collected by questionnaires is subjected to interpretative analysis, which is in a constant state of discovery and revision.

Limitations

The limitations of the study were: a) The research population consisted of responses only five adult respondents. Children's voices could not be heard due to the refusal of authorities to allow me to come in contact with them; b) Being a case study it is not possible to make generalizations about the larger social context. These findings can only be used as an exploratory research that can lead to more in-depth and larger studies that could lead to generalizations; c) Although the teachers involved in segregated teaching of children with special needs showed interest and reflection, the teachers of the general curriculum did not identify enough with the educational program for children of special needs and did not want to participate in the study.

Validity and Reliability

Regardless of the nature of research, type, or scale of measurement, one needs to answer two basic questions pertaining to collected data (Tashakkori & Teddlie, 1998: 79). The first question relates to measurement validity and asks whether one is truly measuring what one intended to measure/record rather than something else. The second question relates to measurement reliability and asks whether the intended measurement/recording is without error. If a measurement instrument is reliable, it should provide the same result consistently over time, across a range of items and /or across different raters / observers (inter-observer / inter-rater reliability). Hence reliability and validity are ways of demonstrating and communicating the rigor of research processes and the trustworthiness of research findings.

Within qualitative research environments, the established validity criteria have tended to be neglected or rejected, without developing other criteria for the truth-value of qualitative findings (Kvale 1989: 7). It lacks a foundation from which one can assess the difference between objective facts and the subjective conjectures of the researcher. It relies too heavily on the interpersonal involvement of the researcher and on what appears to be arbitrary interpretative judgments. Since the idea of reliability and validity comes from the quantitative methodology it is therefore problematic to transfer them to qualitative studies.

The methodological goal of pure observation, free from theoretical, social, historical or cultural bias has been proven unrealistic. According to Denzin and Lincoln (2003), the concepts validity and reliability must proceed from the epistemological assumptions that underlie qualitative or quantitative domains of inquiry. Within quantitative research there is a traditional dichotomization between object and subject - a belief that there is an observational space between the researcher and the object of study.

According to qualitative research, the belief that the observing researcher through use of uncontaminated human perception can apprehend the object of study is untenable. The observer and the observed are both, part of an interactional system in which, neither the subject nor the object can be defined without reference to the other (Cohen and Manion, 1984: 24-25). There is a matrix of inter-subjective social meaning that human science research operates in. Since the object of study - the other human being - is not inert but a volitional being, *object* become *subject*. Although human experiences are subjective and humans have subjective experiences, they achieve inter-subjective agreements (by communicating) through which they sustain self-knowledge, knowledge about others, and interpersonal cooperation

(Kvale, 1989: 148-152). When we succeed in observing the measurement object of our aims, then the observation and measurement is valid. Kvale (1989) defines validation in qualitative research as investigation, continually checking, questioning and theorizing on the nature of phenomena investigated. The questioning encompasses the criteria for judging the truth-value of the research findings. The question of validity in qualitative interpretative analysis involves the precision or exactness with which expressed views of the respondents are described by the evolved categories representing the understandings and views that were expressed in the interview. Reliability can then be the precision with which the categories succeed in capturing meanings of the data collected. The categories are acceptable if co-judges can understand the can see the connection between data collected and the categories (Tashakkori & Teddlie, 1998: 82-84).

In this qualitative inquiry where primary data are collected from only five respondents, the variations in their responses are considered valuable in order to get a more accurate and comprehensive understanding of the phenomena under study. Validity and reliability is maintained by citing the original text in the Swedish language, procured as primary data from the respondents in order not to lose precision or exactness of the utterances. Attempt is made when summarizing the responses made in the Swedish language, to keep to the spirit of their utterances. However the intention of the researcher is not to find the deep psychological structures that emerge from the ground (as is the practice in phenomeno-graphical researches) but to locate the perceptions of the respondents within the paradigm traditional-progressive with regard to inclusion and democratic ideals. The contradictions found within the Special Education discourses are expected to emerge during analysis and discussion, making the understanding of the phenomena under study a discursive one.

Results and Analysis

Results and analysis are divided into two parts. The first part consists of the secondary data collected from documentations of the structures constructed in the municipality's program for children of special needs acquired through desk research. The second part analysis of the perceptions and attitudes of the respondents to the concept of inclusive education. The actual data collected through the questionnaire were left out in this article because it was in the Swedish language.

Sample

Once allowed to interview adults managing education for children with special needs, the following actors were interviewed: two interviews from special school teachers, one each from a counsellor for autistic students and principal (who was a special educator before) of the middle school (classes 5-9) where integration took place, and the head of the school resource center of the municipality. Responses from teachers of the general stream could not be implemented. They either did not know enough about the concepts under study or they contended the conceptualizations of special schools as being segregated education, and therefore refused to participate in this inquiry. Hence this essay is a case study of one school in one municipality and perceptions, understanding and attitudes of five pedagogues involved directly in the educational activities of children with special needs. They were all educated as teachers of general program with two of them further trained as special education teachers.

Supportive structures for children of special needs at this municipality

This is a documentation of secondary data collected from documentary sources of the municipality where this study was conducted. In 1999 a decision was taken to establish a resource center in this municipality and in 2002 the special needs program incorporated within it, also the program for hearing disability. Today the organization (appendix II) consists of a central resource center with one principal and two assistant principals who share supervisory responsibilities (with local school principals of schools for children with special needs) for the integrated programs, the support center for children with hearing disabilities, hospital schools, psychiatric-help schools and the program to support newly registered children in the community, and its neighboring satellite municipalities. The center has preparatory and pedagogic services, which coordinated and gave professional and consultative services to institutions associated with it. In addition, it also does continuing and follow-up services on long-term basis.

This center also takes care of the new international entrees into the school program and severe to mildly challenged children with the help of both the existing school structures and special segregated institutions (organizational differentiation). The different teams work to bring together their competences in order to support the personnel in the municipality schools who work with students with learning difficulties through consultation, instruction and supervision, in-service training and net-working. Conceptually in Sweden, special needs programs are staggered into eight levels in terms of the severity

of their conditions. The resource center supervises and organizes educational activities for levels 7 and 8. An inverted pyramid (see appendix III) delineates the continuum from least restrictive (mild) to most restrictive (severe) placements depending on the degree of disabilities. The center's documentation shows that in the year 2011, approximately 199 students were being taken care of by the municipality resource centers. These students were differentiated into the following categories: neuropsychiatric challenges, speech disorders; language, reading, writing, reading and mathematical challenges; as well as those having intellectual, social and emotional challenges (see appendix IV for details). From the above facts it is inferred that, this municipality as well as others in Sweden practice both organizational and pedagogical differentiation of children with special needs. These differentiations have undoubtedly been made to provide maximum opportunities for children of special needs, even though it appears to be located within the traditional model where organizational differentiation is seen as the only way to administer special needs programs. The following paragraph analyzes these differentiations and places them within pedagogical theory.

Differentiation and Special Pedagogy

Educational policies in Sweden have on the one hand favored the intellectual elites and their well-being, and on the other hand stressed equality and social democracy through the concept one school for all (Isling, 1984). Person (1998a) categorizes the phenomenon of differentiation into two kinds: a) Organizational differentiation and b) Pedagogic differentiation. According to Dahlöf (1967), differentiation per se need not be seen as a politically incorrect concept. Organizational differentiation implies differentiation between schools such as public and private schools, and accelerated and remedial teaching groups. He advocates that organizational differentiation ought to be replaced by pedagogic differentiation where the pedagogic content and method are adjusted to suit each student's individuality in order to promote inclusion, quality in educational processes and to pupil diversity and heterogeneity.

Studies show on the one hand, that ability grouping (organizational differentiation) has some positive effect on the students' school performances and on the other that students with learning difficulties in a high ability group experienced that the gap between them was too large to bridge (Goldberg, Passow and Justman, 1966). In USA on the one hand, students in positively differentiated high track program showed more positive self-perception than the students in negatively differentiated low track program (Oaks, 1985). On the other hand there was a danger that teachers lower the level of ambition in low ability groups, and underestimate the capabilities of students in lower track classes.

In countries like Finland and Italy there are laws prohibiting streaming by ability grouping. According to OECD (1995), in Italy the term Exceptional children is used to describe children of special needs. In countries like Germany, Netherlands and Switzerland where organizational differentiation is practiced, terms such as learning disabilities, language and communication disabilities, psychosocial disabilities, deviant behavior, and emotional-disturbance are used.

The concepts heterogeneity and homogeneity are motivating factors in the differentiating aims of special pedagogy. Peter Haug (1998) the author of *en skola för alla* (one school for all) notes that special pedagogy can be viewed from a compensatory perspective and from a democratic participatory perspective. The former is connected to performance of students with special needs and provide assistance in order to help the student maximize his or her potential according to his or her abilities. This has led to organizational differentiation in order to provide help to special needs student. In the democratic participatory perspective, the institutional arrangements are de-normalized in a way to accommodate children with special needs, heterogeneity and pluralism.

Respondents understanding of the terms segregation, integration and inclusion.

The following paragraphs document the primary data collected by the researcher. Segregation was perceived by these respondents as both a negative and a positive concept. Segregation was perceived to mean exclusion from ordinary schooling where children with special are put aside so that that students who are in the ordinary school may have no contact with them, as well as a secluded place where challenged children are trained outside the ordinary school system in order to help them maximize their individual potential and make them as independent as possible. The aim was to strengthen them in order to help them come back and cope with the ordinary school curriculum. The concept integration was consistently understood as a system in which all children had possibility to be part of some sort of school system, which helped them access contact with each other. Inclusion was perceived as a wider concept that meant a more perfect variation of integration. Here all students came to a school, which was adapted

to suit the needs of children with different challenges, thus creating an equal school environment that could be accessed by all children.

It is inferred from the data that the respondents of this study were participating in both organizational and pedagogic differentiation and saw both advantages and disadvantages of segregated Special-schools. The administrators were more vocal about the value of the segregated special schools. Integration was perceived as being the ideal because it made it possible to both compensate the child with specialized, individualized and small group learning, as well as be involved in the general class room in certain aesthetic subjects. Inclusion was seen as a higher form of integration and was associated with specialized equipment and materials to suit individual needs.

Need for special programs for children with special needs

Respondents actively involved in the programs for children with special needs at middle school, were seriously concerned about the issues involved. Inclusion was to be aimed, and exclusion from the ordinary school milieu was to be avoided, however a few students with special handicaps and challenges needed to be addressed in the most pedagogically and emotionally effective manner, which may include part-time individual instruction, segregated class rooms and even segregated schools. The respondents felt that the school system had a responsibility to help all children to reach the pedagogic goals set for them. It was important to address individual challenges with individual solutions for optimal development without being excluded from the ordinary environment. Respondents felt that one could not generalize and say that all challenged students should be instructed in an inclusive class. Respondents felt that in fact all children should have the possibility to function at their own tempo and not pressurized to fit into a common program. It is inferred from the above data that according to the respondents, inclusion was the idealized approach to educating children with special needs. Special education was seen as a concept different from inclusive classrooms. It was felt that in certain cases of severe challenges, inclusion was not the appropriate remedy. This view is supported the ongoing debate on Swedish education system, where one group feels that homogenous and protected teaching situations contribute positively to optimize development in severely challenged children (see Andersson & Thorsson, 2007).

The role of special schools and resource-classrooms

Special schools that are defined as segregated educational form were seen as structures that could actually provide children with special needs a protected form of inclusion into the Swedish educational program. It catered to their intellectual needs and capabilities. It functioned as an alternative home for children from homes with disjuncture. Segregated special schools and resource rooms were considered especially by the three administrators, as an effective and excellent way of providing educational support. Children felt at home in their special class room, because they could progress at their own pace without any pressure.

Advantages and disadvantages of segregated, integrated and inclusive education and their impact

Segregated education - The advantages of segregated education were perceived by the respondents as providing a secure stress free learning environment with professional trained to understand their needs better. In addition the special schools were equipped for the needs of children with special needs. There was small group teaching, and social skills and adjustment, self-esteem and sense of emotional security could be achieved in a protected segregated structure. Disadvantages of segregated education for children of special needs were children with special needs could feel excluded and feel that they cannot cope with children of normal abilities in the general classroom. An artificial environment was being created and their normal peers could not influence the segregated students. The enthusiasm shown in favor of segregation, places the group of respondents firmly in the conservative category with regard to the issue of inclusion and segregation. They have opted for the compensating children with special needs in segregated settings rather than a more democratic inclusive setting in the general classroom. However, there was an encouraging understanding in this group that segregation was creating an artificial space where children were being excluded from the mainstream school society.

Impact of segregation was perceived as improvement in achievement, social adjustment and social skills, improvement in self-esteem and improvements in terms of emotional security. It was felt that one needed a school, which was suited to individual needs. Different children needed to be challenged to differing levels. In this school a conjoined special school functioned extremely well in terms of meeting individualized needs of children with special needs. It was found to improve their learning abilities (academic achievement). Small group learning situation was found to be more secure and accepting of

challenged children. Socially it was good that special schools were attached to ordinary school and were integrated into some of their routine facilities such as playground, lunchroom, art and craft, music, sports and home economics school spaces. There was a danger of overprotecting challenged children who could then develop behavior that would not function in the larger society (social adjustment). The issue of improvement in self-esteem was perceived as being totally individual. Most challenged students improved their self-esteem in a segregated protected and an attentive environment (self-esteem). It was felt that most challenged children felt emotionally secure in a segregated and protected environment. Such an environment that encouraged smaller groups helped challenged children to develop an emotionally secure identity (emotional security). It is inferred from the above data that the respondents enthusiastically acclaim the impact of segregated special education. This can be viewed as evidence to support that the traditional form of schooling children of special needs is seen as being very effective, despite ideologically being retrogressive from a democratic perspective.

Integrated educational programs – Integration was seen to facilitate interaction between children of special needs and children with normal abilities. Integration would improve their self-esteem by making them to not feel different in any way. It could possibly speed up their learning pace and broad their exposure to information. Only students with mild forms of intellectual challenges are integrated. Since they have their own curriculum they feel secure while working to actualize their full potential. However there could be a risk that these children may not actualize their full potential and feel excluded. Integration is seen as being appropriate only for children with mild challenges. This can be seen as a conservative worldview among caretakers of these children or a perceptive position that is concerned with compensating the student's challenges.

Impact of Integration – A couple of respondents felt that integration was perceived as undoubtedly positive. Challenged children were allowed to grow at their own pace while having a feeling of being part of the ordinary school. While a couple of respondents felt that children in school learned less in a larger environment (academic achievement). Integration was perceived as being absolutely helpful towards challenged children to learn behavior pattern that could help them fit into the larger society. There was a more open contact between challenged children, normal children and the adults (social adjustment). If integration is successful then there could be improvement in challenged children's self-esteem. They learn to solve problems by themselves. On the other hand integration can backfire if not handled properly (self-esteem). It was difficult to know if challenged students felt emotionally secure in an integrated environment. If Integration was successfully handled, student could feel more emotionally secure on the other hand it could be disastrous (emotional security). Integration was unanimously felt as a positive thing because it provided the students with the best of both worlds: protected learning situations in resource rooms and a happy meeting between the two worlds. The emotional and psychological impact was not perceived as positive as one would want it to be.

Inclusive education – Ideally, individualized education for all children was the correct model for education so that all children learn at their own pace and this model would lead to inclusion. However it is very difficult to blend normal, mildly and severely challenged students in the same class and the latter could experience a sense of failure if they are expected to follow the curriculum for normal children because they are unable to cope.

Respondents show extremely positive attitude towards inclusive education. They idealize a situation where children with special needs feel a part of, and participate in the larger mainstream classroom. There seems to be confusion about the scope of inclusion because the respondents express fear that these children may not be able to cope with the general curriculum. They perceive inclusive education as one where all children in the inclusive classroom follow the same curriculum and not one where each child follows the curriculum at his own pace according to their intellectual capacity.

Impact of inclusion – Two respondents left out the section about impacts of inclusion, possibly because this school does not practice inclusion except in the case of autistic children. Those who addressed the issue of impact due to inclusion felt that improvement in all four areas viz. academic achievement, social adjustment, self-esteem and emotional-security could occur if conditions of inclusion were favorable and optimal, especially for children who are not severely challenged. On the other hand it could backfire in all four areas in inclusive education was not adjusted to the challenges experienced by children.

It is telling that two respondents working with special education found it difficult to answer impact issues for inclusive education, possibly because they have never experienced inclusive education or its impact.

The remaining three respondents made guesses about the possible impact. They felt that they could not categorically state its impact. It is surprising (and shocking) to hear that none of the respondents had heard of the Salamanca declaration. The latest debates at the international level were not percolating down to the personnel handling children with special needs. None of the general teaching staff agreed to answer this questionnaire, because they view segregated schooling as the more effective one, where the children with normal abilities could continue to access the general curriculum without hindrances to the teacher, who would have been hard pressed if they had to divert their attention to the children with special needs. A couple of these teachers expressed that they do not agree with the text book definitions of terms segregation, integration and inclusion. It would not be far from truth if one were to be concluded that the teachers in the general class rooms follow the traditional teaching patterns and have not been oriented by the teachers college to internalize the concept or practice inclusive teaching methods.

In addition to this, school practices such as streaming of children according to their performance (organizationally administered pedagogic differentiation) and the remedial program has a slightly different look than that followed by the students of general stream. Traditionally streaming students according to ability and performance was justified as effective because some sort of accelerated learning and remedial learning could be administered within the school system. This could be viewed as supporting intellectual elitism with schools. Administrators and teachers of special education program were also located in the same traditional paradigm, where children of special needs were segregated into homogenous groups and taught in resource rooms by resource personnel or in an adjacent training school connected to the mainstream school, where they shared the lunchroom, sports field, and the teachers of aesthetic subjects. Some form of integration was going on in this segregated system for children of special needs. Only the mildly autistic children were truly included in the general classroom curriculum because they were considered not intellectually challenged. The authors view resonate the ongoing debate in the Swedish school system (see Andersson and Thorsson, 2007) that it is ideally correct and possible to have inclusive classrooms with more individualized teaching for all children including the severely challenged students. It is necessary to change the present teaching model of teaching homogenous groups of students and attempt to incorporate one where diverse and heterogeneous groups of students are accommodated within the general class room, and the use of teaching methods suited to the individualized needs of the students is practice. It would mean a reorganization of resources to support the general classrooms with student assistants, teachers with sign language, Braille, special materials like audio bands, computer soft wares specially geared to the learning needs of the students.

Discussion

Notions about social justice and human rights have provided to shape contemporary thinking about environments in which education is framed. The kind of society we create emerges from the kind of education we provide. The quest for comprehensive and inclusive education is part of that tradition that sees benefit to all emerging from practices adopted in education (Thomas and Vaughan, 2004). Considering the conditions in which children with various challenges were located before the 18th century, the idea of addressing the students' individual differences in a planned, systematically monitored arrangements of teaching procedures, with adapted equipment and materials, accessible settings and interventions designed to help learners with special needs to achieve a higher level of personal self-sufficiency and success in school and community than would be available if the students were only given access to a typical classroom education, was a radical concept (Nilholm, 2006).

The situation for children of special needs differ in different countries. In many countries severe intellectually and physically challenged children do not attend formal schools. In the developed countries, Europe, Japan, USA, Australia, New Zealand and Canada, special schools take care of children with severe challenges, which are considered as not being inclusive arrangement. Today there is a perceived stigma attached to the idea of segregated learning. Positivism's value-free ideas were challenged by the subjectivity-oriented paradigm of the 70s and postmodern worldview. Today we understand and legitimate value loaded ideas and knowledge (especially if they are considered politically correct). Coupled with that, the growth of identity politics has brought about a demand for equal rights of traditionally marginalized groups like women, people of colour, non-heterosexual. This is a post-Marxist development and to these post-Marxian categories have been added the groups that are functionally challenged.

Concern for children with special needs has led both to the creation of different forms of special classes, special courses, special schools, clinics, as well as a vision of schools where children of differing abilities and challenges study together in an inclusive way. *En skola för alla* (one school for all) coined by Peter

Haug (2000) is an expression of a school with explicit basic values that differ from those of the traditional schools. It is a school where all children irrespective of their challenges attend and where teaching is adapted to the individual child or groups of children. It's a school where all children can meet and access each other, and can develop self-confidence, self-respect, self-esteem, intellectual and social competence as well as be part of the social network. It is from such a vision of schooling that the concept inclusive schools and integrated schools have emerged (Nilholm, 2004).

In practice *One school for all* has been domesticated and tamed by the Swedish school system with cosmetic adjustment in the traditional school. The history of special education in general has shown that inclusion and integration that are variations within the *One school for all* concept are difficult to attain because the values of the practitioner and the policy-makers are in conflict with each other. This has led to a compromised solution, which tends towards the traditionally established segregated schooling rather than inclusive education (Andersson and Thorsson, 2007). Researches in Swedish Schools have shown that it is possible to implement *One school for all* model with different kinds of supportive solutions. The findings of the inquiry done in this essay show that segregated variations in schooling (coupled with integration within the general school, in a small way) for children of special needs has been experienced by serious care takers as being beneficial intellectually, socially, emotionally and in terms of self-esteem. The protected and secure environment offered by such arrangements is insidiously persuasive. While inclusion of children with mild autism is experienced as being successful in terms of these criteria, attempt has not been made in schools like this one, to tailor an inclusive school where all children with different challenges can be accommodated into the general classroom. One can safely say that the school policies in this municipality, and school personal for educating children of special needs in this school, are firmly located in the traditional paradigm where children were segregated into homogenous groups depending on their respective diagnosis. Since the findings of this study were documented and commented upon here by me, I have had the opportunity to work in a municipality school in Lapland where inclusive education is being practiced. Such efforts can lead to successful inclusion if teacher-training colleges in turn train teachers to internalize inclusive pedagogies and teaching methodologies.

There have been debates about whether the stress caused due to inclusion of children with challenges, are pedagogically correct? Are we being swayed towards the ideology of inclusion without considering the needs of the children and the resources required to implement such learning environments? Ideologically, social justice, human rights and politically correct locations demand a more inclusive education, while ground realities of a more segregated forms of schooling persist because, teacher training pedagogies in Swedish teachers colleges conform to the needs of the existing organizational differentiation rather than fork out and train teachers for new inclusive schooling. Salamanca declaration that advocates inclusive education for all children and pedagogic differentiation, has not yet percolated to the municipalities and schools, and are only just being introduced into the teacher education programs.

It appears then that inclusive education scholars need to explicate the discourses of Inclusion. Slee and Allan (2001) point out that the distinction between inclusion/exclusion (not to mention abled / disabled) is discursive. If inclusive education has to become a reality in Swedish schools, more grounded theoretical discourses have to emerge in Sweden towards more democratic and progressive ways of catering to needs of children with special needs. It would require collaboration and cooperation at all levels of policy makers and implementers which would also mean political will on the part of the elected politicians in the parliament, the bureaucrats and administrators in the Ministry of Education and the municipalities, teachers colleges and school leadership, to allocate resources and give direction to a more progressive form of schooling where *One school for all* does not get watered down to sophisticated segregated class rooms that cater to accelerated education, remedial education, and a segregated special education.

Conclusion

To conclude, the multi-disciplinary special education can be placed into a socio-political paradigm, which reflects structural differences within society. Persson (1998a) asserts that if one deconstructs special education, its inconsistencies, silences and contradictions can be uncovered. Skritic (1991) argues that special education depends on naïve pragmatism. If one were to question the assumptions of special education, one will be forced to confront the failures of general educational practices. It is therefore necessary to replace traditional bureaucratic organization of the school by new flexible and more appropriate solutions. In doing so one needs to synthesize an approach where both the democratic and compensatory perspective is kept in sight. Persson (1998a) observes that if every fifth student in the

middle school in Sweden is in need of differentiated activities, then another form of teaching than what is going on in Sweden is needed.

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Appendix – 1**Openended Questionnaire for Teachers and Administrators**

Please answer in detail. Write as much as you like in the Swedish language. Give all your opinions. Your experience is invaluable.

Name of teacher:

Professional Qualifications:

Professional history:

Nationality:

Subjects taught:

Q1. Why is there a need for special programs for children with special needs? Give both positive and negative opinions.

Q2. What function does the special school play in the life of children with special needs? Can you suggest an alternative to special school?

Q3. What is your role in the program for children with special needs?

Q4. Can you give details about the program this school offers to children of special needs?

Q5. Can you describe what you understand by the terms (when applied to children of special needs):

- a) Segregation
- b) Integration
- c) Inclusion

Q6. Can you give advantages and disadvantages of:

A i) Segregating (särskola utbildning) children of special needs:

- ii) Which category of children with special needs are segregated (educated in special schools)?
- iii) What personnel, equipment and materials are needed for segregated (special schools) teaching of children with special needs?
- iv) What impact has segregation (special schools and resource class room) made in terms of:
 - Improvement of academic achievement
 - Improvement of social adjustment and social skills
 - Improvement in self esteem
 - Improvements in terms of emotional security.

B. i) Integrating of children with special needs (advantages and disadvantages of):

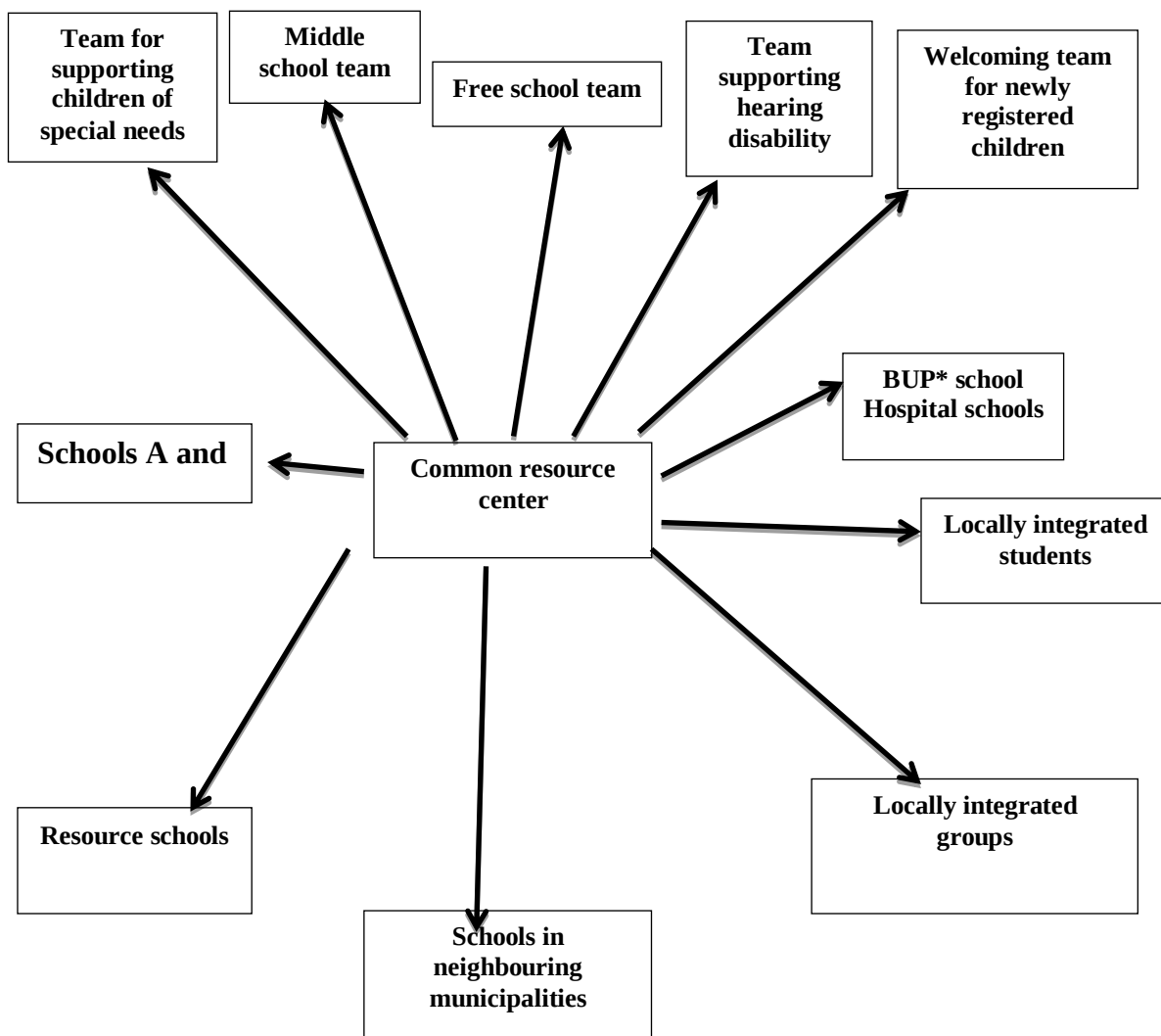
- ii) Which category of children with special needs are Integrated?
- iii) What personnel, equipment and materials are needed for integrated teaching of children with special needs?
- iv) What impact has Integration made in terms of :
 - Improvement of academic achievement
 - Improvement of social adjustment and social skills
 - Improvement in self esteem
 - Improvements in terms of emotional security.

C. Total Inclusion of children with special needs (advantages and disadvantages of):

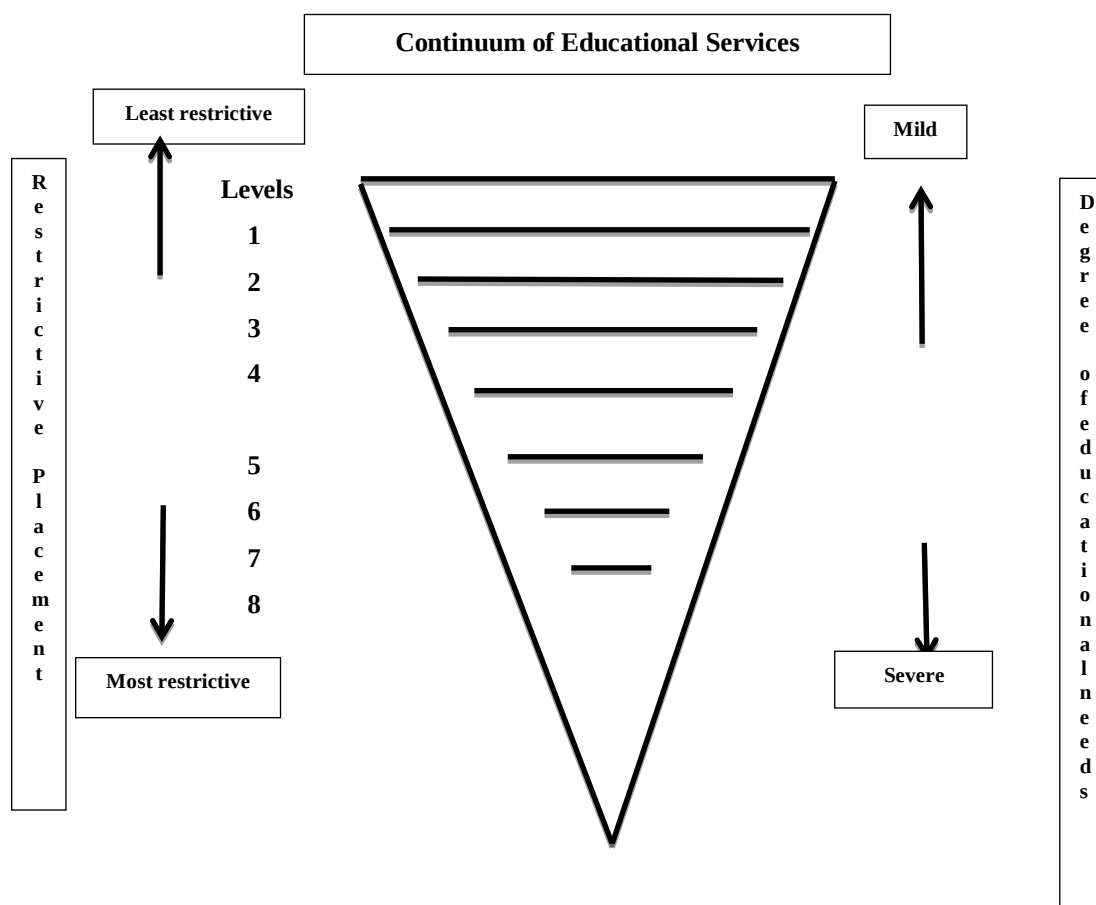
- i) Which category of children with special needs are included?
- ii) How many children are in the inclusive program? What are their disabilities? What individualized teaching is given to them?
- iii) What personnel, equipment and materials are needed for inclusive teaching of children with special needs?
- iv) What impact has inclusion made in terms of:
 - Improvement of academic achievement
 - Improvement of social adjustment and social skills
 - Improvement in self esteem
 - Improvements in terms of emotional security

Q7. Is there any category or important area left out in this questionnaire? Feel free to add any other comment.

Appendix II
Organization of the Municipality Resource Center 2011¹



¹ From a power point program prepared by of the municipality.

Appendix III²**Key**

1. Limited support in the classroom
2. Comprehensive support in the classroom
3. Limited extra input
4. Extensive extra input
5. Part-time special/individual instruction
6. Whole-time special/individual instruction
7. Resource/special school
8. Special boarding school

² From a power point program prepared by of the municipality.

Appendix IV **Categorization of Challenges³**

Neuro-psychiatric challenges

ADHD
Autism
Aspergers syndrome
Tourettes syndrome
Other

Social and emotion disturbances

Aggression
Inner- directed
Psychic illness, e.g. depression
Other

Specific-reading- writing-and mathematical difficulties

Dyslexia
Dyscalculia
Other

Illegal behavior

Drugs
Criminality
Other

Serious speech Impairment

Dyslexia

Physical challenges

Chronic illness
Hearing disability
Visual Impairment
Movement impairment
Other

Serious intellectual challenges**In middle school**

Individualized/integrated Special School
student with rights to special schools and
special middle schools

³ From a Municipality Power Point.

Appendix V

A Peaceful World is an Inclusive World



Inclusion Matters

RELATION OF CHARACTER STRENGTHS TO PERSONAL TEACHING EFFICACY IN KOREAN SPECIAL EDUCATION TEACHERS

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Many factors that may affect personal teaching efficacy (PTE) of special education teachers have been discovered. However, little is known about the relationship between character strengths (CS) and PTE in them. This study aimed to investigate CS in relation to PTE in Korean special education teachers. Character Strengths Test-Short Form (CST-SF) and Teacher Efficacy Scale-Personal (TES-P), respectively, assessed the CS and PTE of 111 Korean special education teachers. Results showed that four dimensions of the CST-SF (interpersonal, restraint, intellectual, and theological strengths) were significantly related to PTE, indicating that teachers with high CS were likely to experience greater PTE. Regression analysis indicated that the areas of interpersonal and restraint strengths significantly predicted PTE. The results have implications for the development of effective programs for special education teachers as well as the formalization of special education teacher recruitment policies.

Introduction

The construct of teacher efficacy has a theoretical basis in Bandura's (1977) concept of self-efficacy. It has been defined as teachers' belief in his or her capabilities to influence how well students learn, even among those students who may be considered difficult or unmotivated (Guskey & Passaro, 1994). Several factor analysis revealed teacher efficacy to be bi-dimensional (Coladarsi & Breton, 1997; Gibson & Dembo, 1984; Woolfolk & Hoy, 1990): Personal teaching efficacy (PTE), which refers to the teachers' belief in their ability to bring about change in students, and General teaching efficacy (GTE), which refers to the teachers' belief that students can be taught despite external factors, such as their family environment (Gibson & Dembo, 1984). However, the concept of GTE has caused much controversy (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

According to previous studies, several factors that affected PTE fell into three categories: (a) environmental and contextual elements (for example, school level, school structure, teacher affiliation, lack of support from administrators or school leadership, and administrator turnover) (Adams & Forsyth, 2006; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Hoy & Woolfolk, 1993; Tschannen-Moran & Woolfolk Hoy, 2001); (b) demographic factors such as age, gender, and years of experience (Ross, Cousins, & Gadalla, 1996; Schonfeld, 2001; Tschannen-Moran et al., 1998) and (c) the teachers' personality traits. Regarding the last category, extraversion predicts classroom management while conscientiousness predicts instructional strategies as well as student engagement (Navidnia, 2009).

In recent years, character strengths (CS) have been emerging as an important focus in the teaching profession. Definitions of CS have included pre-existing qualities that arise naturally, feel authentic, are intrinsically motivating to use, and energizing, thereby increasing the probability of healthy outcomes (Linley, 2008; Peterson & Seligman, 2004).

Previous studies have shown that CS has a connection to personal, social, academic, and occupational functioning. For example, high CS is associated with efficiency in coping with problems and difficulties (Denovan & Macaskill, 2013) and with higher levels of subjective well-being (Park, Peterson, & Seligman, 2004). There exists a positive relation between CS and the academic success of college students (Lounsbury, Fisher, Levy, & Welsh, 2009). Finally, deploying CS is related to job satisfaction and meaning at work (Littman-Ovadia & Steger, 2010).

In the teaching profession, relevant evidence has indicated that CS seems to be one of the personality traits that potentially influence PTE (e.g. Chan, 2009). In a sample of Chinese teachers (Chan, 2009), the strengths of zest, hope, gratitude, and humanity were robustly associated with subjective well-being (Chan, 2009). Consistent results were found in the samples of Slovenian teachers, indicating the highest correlation of hope, zest, gratitude, love, and curiosity with life satisfaction (Gradisek, 2012). Although, these previous findings suggest that CS may play an important role in PTE, there have yet been studies that examined the relationship between CS and PTE in teachers.

The present study aimed to clarify the associations between the CS and the PTE in special education teachers. Up until now, the focus of PTE research has been centered on general education. However, a high level of PTE is vital for special education teachers in order to fulfill the unique social and academic needs of their students (Leyser, 2002). Research indicates that teachers possessing a high degree of PTE are less likely to refer difficult-to-teach students to special education than teachers with a low degree of PTE (Soodak & Podell, 1996). In addition to setting high academic standards, high PTE teachers demonstrate positive attitudes toward low-achieving students, establish rapport, and build relationships (Ross & Bruce, 2007). Also, research shows that special education teachers with a high PTE tend to spend more time and effort in planning, exhibit greater organization, provide clarity in their instruction, and have greater enthusiasm (Allinder, 1994). Thus, the relationship between CS and PTE must be evident in special education teachers.

Given the diverse psychosocial environments of schools and the multiple pathways there for developing strengths, every CS dimension (interpersonal, restraint, intellectual, and theological) is likely to be positively related to PTE. In addition, on a basis of prior findings that conscientiousness and extraversion are the trait most commonly associated with teacher efficacy (Navidnia, 2009), the restraint and interpersonal strengths, the dimensions that correspond to conscientiousness and extraversion, might be highly related to the PTE.

Research Method

Participants

111 Korean special education teachers holding full-time positions in three schools participated on a voluntary basis; 27 males and 84 females, ranging in age from 23–59 years with a mean (SD) of 33.1 (7.30) years. The participants' teaching experience in special education ranged from 1–29 years, with a mean of 6.8 years.

Measures

The Character Strengths Test (CST; Kwon et al., 2010) is a well-performing, 240-item self-report questionnaire. The scale consists of 4-point Likert-style items for measurement of the degree to which respondents endorse each of the 24 strengths of character in the Values in Action (VIA) classification (Peterson & Seligman 2004). Individuals are asked to report on the degree to which statements reflecting each of the strengths apply to themselves. Scales for the CST have satisfactory alphas ($>.70$) and test-retest correlation ($>.70$) (Kwon et al. 2010). The short form of the CST (CST-SF; Lim, 2012) was developed to preserve the coverage and structure of the full CST while reducing its length. Correlations between the CST-SF and the full-form primary scales were uniformly high (.80–.92). The internal consistency estimates for the CST-SF scales were also generally high, ranging from .72 to .84. When empirical factor analysis was performed for an assessment of the CST, a four-factor solution (interpersonal strengths, restraint strengths, intellectual strengths, and theological strengths) was found in the Korean population (Lim, 2012).

When assessing teachers' efficacy, the Korean version of the teacher efficacy scale-Personal (K-TES-P) for special educators was used (Coladarci & Breton, 1997; Lee, 1998). The TES-P was developed by Gibson and Dembo (1984) for use with regular educators, a modified version of which was administered to participants in the current study. Each of the items rated from 'strongly disagree' (coded as 1) to 'strongly agree' (coded as 6). Although validity and reliability for the modified scale (Coladarci & Breton, 1997) have not been established, the original version of the scale has demonstrated adequate discriminant and convergent validity, as well as internal consistency reliabilities for the TES-P (Cronbach's $\alpha = .78$) (Gibson & Dembo, 1984). The internal consistency coefficient of the K-TES-P for the current study is .94.

Statistical Analysis

Firstly, bi-variate Pearson correlations were calculated between each pair of measures. Secondly, hierarchical regression analysis were conducted to evaluate whether CS primarily predicted PTE after

controlling for gender, age, and years working. During the analysis, age, gender, and years working were entered in the first step and the four factors of the CS were added in the second step.

Results

As shown in Table 1, the four factors of the CST-SF were significantly correlated with the K-TES-P, ranging from .26 to .46. Interpersonal strengths, restraint strengths, and intellectual strengths were moderately associated with the K-TES-P ($r = .42, .46$, and $.33$, respectively), while theological strengths had small size correlations with the K-TES-P scores ($r = .29$).

Table 1. Inter-Correlations between PTE and CS Dimensions

	PTE	Interpersonal	Restraint	Intellectual	Theological
PTE	-				
Interpersonal	.42***	-			
Restraint	.46***	.69***	-		
Intellectual	.33***	.77***	.71***	-	
Theological	.26**	.58***	.51***	.51***	-

Note. PTE = Personal Teaching Efficacy; CS = Character Strengths; Interpersonal = Interpersonal Strengths; Restraint = Restraint Strengths; Intellectual = Intellectual Strengths; Theological = Theological Strengths

*** $p < .001$, ** $p < .01$

When gender, age, and years working were entered in the first step of the regression equation, they significantly predicted the K-TES-P, $t(104) = -1.78, p = .07, t(104) = 1.22, p = .22, t(104) = .32, p = .74$, respectively. Interpersonal and restraint strengths accounted for significant additional variance in the K-TES-P when it was entered on the second step, $t(100) = 2.45, p < .05, t(100) = 3.02, p < .01$, respectively. Intellectual and theological strengths were not significant predictors of the K-TES-P, $t(100) = -1.27, p = .20, t(100) = -.82, p = .41$, respectively (Table 2).

Discussion

This is the first study that explores the relationship between CS and PTE in special education teachers. Our findings showed that the four dimensions of CS were moderately correlated with PTE. Interpersonal and restraint CS had the highest correlations with PTE, indicating that these are crucial factors for enhancing PTE. This suggests that Korean special education teachers who perceive themselves as having high interpersonal and restraint CS tend to believe in their ability to bring about change in students than those who had low levels of interpersonal and restraint CS. Furthermore, these two CS factors made a significant and independent contribution to PTE even after controlling for gender, age, and years of experience. This finding suggests that the restraint and interpersonal CS primarily contribute to the development of PTE.

The interpersonal and restraint CS are considered to correspond to extraversion and conscientiousness among the big five personality traits, respectively (Peterson & Seligman, 2004). According to previous studies, an individual who is highly extraverted will exhibit better job performance when the nature of the job is characterized by social interaction such as sales or marketing (Bing & Lounsbury, 2000; Vinchur et al., 1998). In case of the special education teachers, social interaction is important for effective teaching. For example, a large part of a special education teacher's work involves interacting with others. Special education teachers frequently communicate and coordinate with parents, school psychologists, social workers, school administrators, occupational and physical therapists, and other teachers. Given that job performance is associated with teacher efficacy (Caprara, Barbaranelli, Steca, & Malone, 2006; Di Fabio, Majer, & Taralla, 2006), this may be a potential explanation for why interpersonal CS was the main predictor in our model. Regarding restraint CS, much of the research has indicated that conscientiousness corresponded to this domain. One of the main characteristics of conscientiousness is delayed gratification or persistence (Nettle, 2007) and is the main predictor for job performance across a range of job positions and different occupations (Dudley, Orvis, Lebiecki, &

Cortina, 2006). Delayed gratification, or persistence is valued by special education teachers. For example, working with special-needs students can require much time and effort, meaning that special education teachers have to be persistent.

Table 2. Summary of Regression Analysis for Variables Predicting PTE (n=111)

Variable	B	SE B	β
Step 1			
Gender	-3.95	2.21	-.17
Age	.26	.22	.18
Years Working	.08	.25	.05
Step 2			
Interpersonal Strengths	6.85	2.79	.36*
Restraint Strengths	8.23	2.71	.38**
Intellectual Strengths	-3.64	2.87	-.18
Theological Strengths	-1.53	1.86	-.09

Note. $R^2 = .07$ for step 1, $R^2 = .24$ for step 2 (p values < .001), PTE = Personal Teaching Efficacy

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

The findings of this study have important implications for the development of effective programs for special education teachers as well as the development of special education teacher recruitment policies. For instance, a pre-service teacher program aimed at enhancing CS is likely to prevent a low PTE that may emerge at some time in the future. This program must assume the form of a focused intervention to develop the specific dimensions of CS that were the main predictor of PTE in this study. The current findings suggest that early in prospective teachers' time at the university serves as the time to design and implement such interventions.

A number of important limitations must be considered: First, only self-reported data was included, and the relationships between study variables may have been inflated as a consequence of questionnaire-specific method variance. Future research should employ a multitrait–multi-method assessment. Second, the investigation was conducted within a limited region, meaning a fair amount of caution when generalizing the present findings to other cases. This investigation should be replicated with a more representative sample from the general population.

The present study takes the first step in reporting that the dimensions of CS are related to PTE in special education teachers. The current study could stimulate further exploration of the relationship between teachers' CS and PTE. Also, the findings of this study could help design intervention for the special education teachers and develop the recruit policy of special education teachers.

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SPECIAL EDUCATION TEACHER TRANSITION-RELATED COMPETENCIES AND PREPARATION IN SAUDI ARABIA

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Preparing special education teachers to engage in transition services is a critical part of their preparation. This study examined how special education teachers perceive their preparation for transition services in Riyadh, Saudi Arabia. A total of 350 teachers participated in this study. Data were analyzed using a two-way ANOVA. The findings indicated that teachers reported having negative perceptions of the transition service aspect of their preparation programs. No differences according to gender or educational background were observed. Implications and recommendations for teacher in-service and pre-service programs are discussed.

Introduction

Many studies have emphasized the particular knowledge and competencies that special education teachers who deliver transition services are required to obtain to succeed in their mission (Anderson et al., 2003; DeFur & Taymans, 1995). Transition services are defined by the Individuals with Disabilities Education Act (2004), Section 300.18, as:

a coordinated set of activities for a student with a disability that—(a) is designed within an outcome-oriented process, which promotes movement from school to post-school activities, including post-secondary education, vocational training, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation; (b) is based upon the individual student's needs, taking into account the student's preferences and interests; and (c) includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and, when appropriate, acquisition of daily living skills and functional vocational evaluation. (IDEA 20 U.S.C. § 1401 118)

Teachers' preparation for transition services and their impressions of the sufficiency of that preparation play a vital role in the success of transition services (Wolfe, Boone, & Blanchett, 1998). Research has demonstrated a significant relationship among teachers' level of preparation, their satisfaction, and the frequency of implementation of transition activities (Benitez, Morningstar, & Frey, 2009). Additionally, educators often rely on teacher preparation programs to acquire the knowledge that is necessary for transition services (Lubbers, Repetto, & McGorray, 2008).

Benitez et al. (2009) examined 557 middle and high school special education teachers in 31 states, and they found that teachers ranked their experience of preparation for transition services more favorably than their satisfaction with their training. The authors concluded that there is a strong relationship between teachers' level of preparation and the frequency of providing transition services; thus, teachers who feel more prepared to deliver transition services provide such services more frequently.

Blanchett (2001) examined regular and special education teachers' perceptions of transition competencies to identify and validate the perceived level of importance of 30 transition service competencies identified in the literature. The results indicated that the top six competencies rated by teachers were assessing social skills, teaching social skills, teaching job-seeking skills, teaching daily living skills, involving employers, and providing career education and exploration. At least 30% of the teachers in this study rated the following competencies as less important: "(a) providing sexuality training/education (30%);

(b) providing case management (30%); (c) providing medication, care, and scheduling training (36%); (d) assessing family-supported recreation/leisure activities (37%); and (e) establishing a plan for student participation in recreation/leisure activities (37%)" (p. 7).

More than half the teachers in the study reported that they received training related to transition services in the following areas: participating in a multidisciplinary team (80%), assessing vocational preferences (82%), managing maladaptive behaviors (86%), writing IEPs/ITPs (92%), teaching daily living skills (84%), and teaching money management (81%).

The study also examined teachers' satisfaction with the transition training that they received in higher education prior to working with students with disabilities. The results showed that 9% of teachers indicated that they felt highly prepared, 39% were somewhat prepared, 24% were somewhat unprepared, and 21% were highly unprepared. Half (50%) the respondents reported that the special education teacher was the person responsible for implementing transition activities.

DeFur and Taymans (1995) surveyed 134 education specialists in special education, vocational rehabilitation, and vocational special education to identify important competencies for transition specialists. The respondents rated the competencies as follows:

- 1) knowledge of agencies and systems changes; 2) development and management of individualized transition plans; 3) working with others in the transition process; 4) vocational assessment and job development; 5) professionalism, advocacy, and legal issues; 6) job training and support; and 7) assessment (general). (p. 48)

Knott and Asselin (1999) examined 204 special education teachers working with students with different types of disabilities; 106 teachers had students with learning disabilities, 51 teachers had students with intellectual disabilities, 30 teachers had students with emotional disturbances, 15 teachers had students with a combination of learning disabilities and emotional disturbances, and 12 teachers had students identified as belonging to other categories. However, the other category was not defined. The researchers found that the teachers in the study believed that professionals who provide transition services must have related knowledge in addition to the necessary skills and abilities to ensure successful transitions. Family and student involvement was rated by the teachers as the most important element in the transition process. These results show a relationship between the level of knowledge and involvement in transition services and perceptions of the importance of such services. Interestingly, there was little difference in the teachers' knowledge, involvement, and importance based on their years of experience, which ranged from zero to 30 years of teaching experience.

In a study by Wandry et al. (2008), the participants included 196 teacher candidates at the graduate ($n = 67$) and undergraduate ($n = 129$) levels in five special education teacher preparation programs in five different American universities. The participants completed pre-semester and post-semester surveys after taking a transition course during the semester. The pre-test showed that the participants believed the most important facilitators in the transition process were parental involvement and student involvement. The participants rated educators' knowledge of transition services as a significant factor for successful transition services, followed by educators' interest in transition services, student involvement, and parental involvement. Furthermore, the authors noted that participants from special education majors (graduate and undergraduate) ranked preparation as higher than their general education peers did. The study also showed that the transition course led to greater perceptions and greater confidence in the abilities of the participants to implement effective transition practices. The participants also reported that more training is needed beyond the transition course that they completed. They also expressed concern regarding the lack of preparation of their peers and administrators in schools.

Trainor, Carter, Owens, and Swedeen (2008) interviewed 14 teachers working in 10 high schools and identified two of the problems during the summer: employment opportunities are more limited compared with other times of the year, and there is an additional lack of community involvement. The teachers in that study were supportive of the development of summer programs; in particular, they were supportive of paid work experiences. The teachers emphasized the importance of developing self-determination for youth during transition planning and instruction, which was also supported in other studies as a critical aspect to be considered in transition program planning (Applequist, Mears, & Loyless, 2009; LaCava, 2005; Wehmeyer, Palmer, Soukup, Garner, & Lawrence, 2007).

In summary, special education teachers must obtain necessary knowledge and competencies to deliver transition services; the teacher preparation for transition programs is challenging; and there are significant relationships among teachers' level of preparation, their satisfaction, and the frequency of implementation of transition activities. The following section focuses on teacher preparation in Saudi Arabia for transition planning.

Teacher Preparation in Saudi Arabia for Transition Planning

Although, there are attempts to reform Saudi Arabian education in general (Alnahdi, 2014a) and special education as a part of this education system, special education teachers in Saudi Arabia are still prepared to work only in elementary schools with students of young ages (Almuaqel, 2008). In addition, in Saudi Arabia, there is no cumulative experience with the transition process to assist students in making the move from school to the work environment (Alnahdi, 2013, 2014b). Without experience, teachers cannot be expected to have a major effect on transitions unless they receive assistance from specialist agencies or outside professionals.

Althabet (2002) examined teachers' perceptions of their preparation in the Special Education Program at King Saud University in Saudi Arabia with a focus on teachers who specialized in teaching students with mental retardation only. He surveyed 255 teachers who graduated between 1992 and 2000. Of the participants, 180 were male, and 75 were female; 72% of the sample had one to four years of experience, whereas 28% had five or more years of experience. The teachers in the study were working either in special education programs in regular education schools (40.39%) or in special education institutes (59.61%). Overall, the teachers reported feeling neutral about the effectiveness of their preparation in the Special Education Program at King Saud University. The results showed significant differences between male teachers and female teachers: the male teachers were more positive about the effectiveness of their preparation program than the female teachers were. There were no significant differences between recently graduated special education teachers (those with one to four years of teaching experience) and more experienced special education teachers (those with at least five years of teaching experience) with respect to their perceptions of the effectiveness of their preparation program.

In the abovementioned study, the teachers' perceptions of the effectiveness of the coursework that they completed during their preparation were approximately in the middle range of the scale, which signaled neither positivity nor negativity with respect to the effectiveness of the coursework. The results show significant differences between male teachers and female teachers in that male teachers were more positive about the effectiveness of the coursework. There were no significant differences between recently graduated special education teachers and more experienced special education teachers with respect to the effectiveness of the coursework (Althabet, 2002).

Al-Wabli (1982) surveyed 188 secondary teachers to evaluate the secondary teacher preparation program at Umm Al-Qura University in Makkah, Saudi Arabia. The teachers in the study felt well prepared in less than 50% (six out of 15) of the teaching skills covered by the study: (1) the ability to use teaching materials effectively, (2) skill in evaluating the academic progress of students, (3) the ability to work effectively with the school administration, (4) the ability to communicate with students with different levels of abilities, (5) the ability to construct appropriate tests, and (6) the ability to construct appropriate lessons.

The teachers indicated that they felt ill prepared in two of the skills (the ability to use school sources and the ability to use school library resources). In the remaining seven skills, they rated their preparation as average: (1) the use of audiovisual aids, (2) the ability to use the Arabic language effectively, (3) the use of a variety of teaching methods, (4) the maintenance of official records, (5) the ability to handle discipline problems in the classroom, (6) time management skills in the classroom, and (7) the ability to motivate students who are not interested in learning (Al-Wabli, 1982).

Next, six education courses were rated highly by teachers in the abovementioned study: (1) Teaching Methods 2, (2) Teaching Methods 1, (3) Developmental Psychology, (4) Educational Media, (5) Introduction to Education and Psychology, and (6) Curriculum Principles. Only one course was rated as below average (Social and Philosophical Foundations of Education). By contrast, five education courses were ranked as having average effectiveness: (1) Curriculum Development, (2) Introduction to Counseling and Mental Hygiene, (3) Education in Saudi Arabia and the Arab World, (4) Educational Administration, and (5) Development of Educational Thought (Al-Wabli, 1982).

Female teachers rated teaching skills and student-teaching experiences in their preparation program less positively than did male teachers. Finally, there were no significant differences among respondents based on their teaching field, type of degree, or years of experience (Al-Wabli, 1982).

Perceptions of Special and General Education Teachers

Wolfe et al. (1998) compared the responses of 39 regular secondary teachers to previously collected data from special education teachers. These authors found differences between special education teachers and regular teachers in their perceptions of the importance of the competencies that are needed by teachers in transition services (Wolfe et al., 1998).

The following competencies were rated as important by at least 90% of regular education teachers: (a) employment concerns, (b) communication concerns, (c) student/interpersonal skills, and (d) residential concerns (Wolfe et al., 1998). Across all competencies, special education teachers gave higher ratings of importance than regular teachers, except in the ability to assess adaptive behavior, which they rated with low importance. Similarly, Stewart (1998) found that special education teachers and vocational specialists rate the important transition to work competencies differently. Wandry et al. (2008) also found that participants with special education backgrounds at both the graduate and undergraduate levels ranked their preparation for providing transition services higher than their peers from general education backgrounds. In short, there are differences between the perceptions of teachers with special education backgrounds and those with other educational backgrounds.

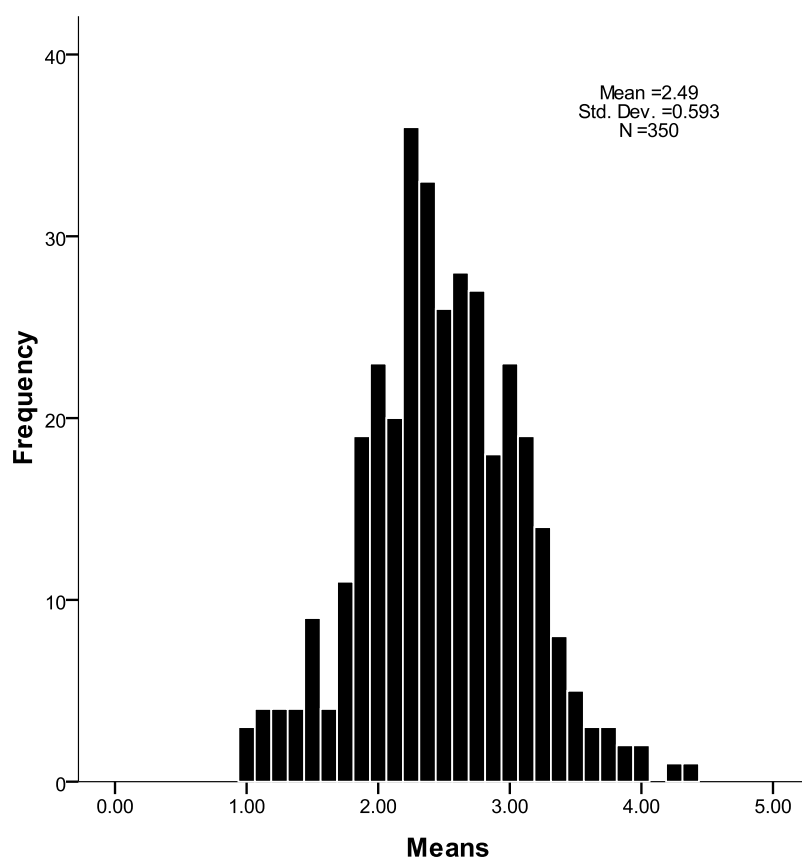


Figure 1. The distribution of teachers' means regarding their preparation.

Methodology

The study survey was distributed to approximately 600 teachers working in special education programs for students with intellectual disabilities, and 350 completed surveys used for this study. The teachers were from 30 schools in the city of Riyadh, the capital of Saudi Arabia. The schools are located in all regions of Riyadh to ensure representation to the greatest extent possible. Mediators distributed surveys and return it within a week. Teachers were asked to voluntarily participate.

In the study instrument, which was developed by the researcher for this purpose, teachers rated items describing their perceptions of how prepared they felt to plan and deliver transition services. A high

mean for the items on the survey indicated that teachers felt well prepared to plan and implement transition services. Cronbach's alpha was .7, which indicates acceptable reliability.

A two-way ANOVA was conducted to examine the mean differences between the teachers by gender and educational background and to determine whether there was a significant interaction between gender and educational background. The following question was posed: are there statistically significant mean differences by gender or by educational background (major)? In addition, an ANOVA was conducted to determine whether there were statistically significant mean differences according to the number of years of experience.

Results

Teachers' perceptions of their preparation

The teachers in this study responded to eight items regarding their preparation to provide transition services. The teachers responded to these items using a Likert scale (with options including strongly agree, agree, neutral, disagree, and strongly disagree). The items were coded as follows: strongly agree = 5; agree = 4; neutral = 3; disagree = 2; and strongly disagree = 1. For negatively phrased items, the coding was reversed. A high mean score on this scale indicated that teachers felt well prepared to plan and deliver transition services (see Figure 1). In general, the teacher responses resulted in an overall mean of 2.49, as shown in Table 1, which indicates that the teachers felt unprepared to plan and deliver transition services.

Furthermore, Table 1 shows teachers' perceptions of their preparation to provide transition services sorted according to five demographic variables: gender, educational background, the level of school taught, the level of education, and the number of years teaching experience. This study sample consisted of 212 male teachers and 138 female teachers. The majority of teachers in this study (304) possess special education degrees, whereas 39 teachers hold degrees in a different major. Most of the teachers in this study (274) work in elementary schools, and the remainder (64) work in middle or high schools. Approximately half of the participants (138) who reported their years of experience possessed more than 10 years of teaching experience, compared with 142 teachers with fewer than 10 years of teaching experience.

Table 1. Mean Perceptions of Preparation by Demographic Variables

		M	N	SD
Overall		2.4976	350	.59331
Gender	Male	2.5284	212	.60934
	Female	2.4504	138	.56677
Educational background	Special education	2.4765	304	.59273
	Other majors	2.6116	39	.59393
School level	Elementary school	2.5094	274	.59689
	Middle and high school	2.4014	64	.59481
Level of education	Bachelor's degree	2.4924	316	.58640
	Master's degree	2.4750	25	.58741
	Other	2.6000	5	.84502
Years of experience	1 to 4	2.5332	48	.74117
	5 to 9	2.5035	94	.53136
	10 to 15	2.4236	102	.57679
	More than 15	2.4862	36	.58937

Descriptive Statistics

More than 75% (271) of the participants reported that there is a significant shortcoming in teacher preparation with respect to transition services. However, 58% (204) of the participants believed that the university courses are sufficient to prepare special education teachers to provide transition services.

Surprisingly, more than half of the study participants (54%, 190 of the 350 participants who responded to this item) agreed or strongly agreed that this survey was the first time that they were exposed to the notion of transition plans for students with disabilities (see Table 4). Although 139 teachers (40%) in this

study agreed or strongly agreed that transition services were the focus of at least one course that they studied at the university, more than 50% (177) of the participants reported that transition services were not mentioned in any of the courses in their bachelor's degree program.

Furthermore, 74.5% (261) of the participants believe that there is a shortage of courses on how to determine goals for students with mild disabilities. However, 61% (214) of the participants reported that they have been trained on how to determine the necessary life skills for students after they leave school. Moreover, approximately 30% (137) of the participants feel that they have sufficient knowledge to create a transition plan for students with disabilities.

Table 2. Descriptive Statistics of the Responses

	SA	A	N	D	SD
There are significant shortcomings in teacher preparation with respect to transition services.	123 (35.1%)	148 (42.3%)	55 (15.7%)	21 (6%)	3 (0.9%)
Transition services were the focus in one course or more courses that I studied in the university.	39 (11.1%)	100 (28.6%)	105 (30.0%)	85 (24.3%)	21 (6.0%)
Transition services were not mentioned in any of the courses for my bachelor's degree program.	59 (16.9%)	118 (33.7%)	108 (30.9%)	52 (14.9%)	13 (37 %)
The university courses are sufficient to prepare special education teachers to participate in transition services.	63 (18 %)	141 (40.3%)	76 (21.7 %)	54 (15.4 %)	16 (5.6%)
There is a shortage of courses on how to determine goals for students with mild disabilities.	95 (27.1 %)	166 (47.4 %)	54 (15.4 %)	26 (7.4 %)	9 (2.6%)
I have sufficient knowledge of how to create a transition plan for students with disabilities.	35 (1 %)	102 (29 %)	135 (38.6%)	66 (18.9%)	12 (3.4 %)
This is the first time that I have been exposed to the notion of a transition plan for students with disabilities.	52 (14.9%)	138 (39.4%)	54 (15%)	88 (25%)	18 (5%)
I have been trained on how to determine the necessary life skills for students after they leave school.	55 (15.7 %)	159 (45.4%)	51 (14.6%)	71 (20.3%)	14 (4 %)

Teacher preparation by gender: As shown in Table 3, there were no statistically significant differences between male and female teachers in their perceptions of their preparation for transition services ($F(1,339) = .439, p = .508$). Therefore, the null hypothesis that there are no significant differences between male and female teachers' perceptions of their preparation for transition services was retained.

Teacher preparation by educational background: There were no statistically significant differences between special education teachers and non-special education teachers in terms of how they perceive their preparation for transition services ($F(1,339) = .058, p = .810$). Therefore, the null hypothesis that educational background causes no significant differences in teachers' perceptions of their preparation for transition services was retained (see Table 3).

Teacher preparation by years of experience: In Table 4, the ANOVA results ($F(3,279) = .496, p = .685$) show that there are no statistically significant mean differences resulting from the participants' years of experience.

Discussion

The results indicated that the teachers generally felt unprepared to plan and deliver transition services. This finding is in part explained by Althabet (2002), who showed that there were no courses related to transition services in special education preparation programs. In addition, the current study found no differences in male and female teachers' perceptions of their preparation for transition services. This finding contradicts the study results of Althabet (2002) and Al-Wabli (1982), both of whom found that male teachers held more positive perceptions of preparation programs than their female counterparts.

Table 3. ANOVA for the Main Effect and the Interaction for Gender and Educational Backgrounds

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.677a	3	.226	.640	.589
Intercept	721.792	1	721.792	2049.457	.000
Gender	.155	1	.155	.439	.508
Education	.253	1	.253	.718	.397
Gender * Education	.020	1	.020	.058	.810
Error	119.391	339	.352		
Total	2236.406	343			
Corrected Total	120.068	342			

$p < .05$

Table 4. ANOVA for the Main Effect of Years of Experience

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.526	3	.175	.496	.685
Within Groups	97.663	276	.354		
Total	98.189	279			

However, this finding is consistent with the results obtained by Hussain (2010), who found that there were no differences in male and female teachers' perceptions of their preparation program for those with a minor in learning disabilities at King Saud University. Hussain (2010) argued that the findings of Althabet (2002) regarding the differences between male and female teacher preparation programs may no longer be relevant because of improvements in the female section of the special education department at King Saud University and because of the increasing number of female professors who have graduated from universities in the United States. Furthermore, based on this researcher's experience as an undergraduate and graduate student at King Saud University, which is the university from which the teachers in this study graduated, this finding seems predictable because of the absence of transition service-related courses for both male and female teachers. Because the preparation programs for male and female teachers are similar and because they work in the same educational environment, it may be expected that no statistically significant differences exist in their perceptions of content-related issues.

This study found no differences in perceptions based on educational background, which may indicate that special education programs are lacking in the transition service aspect of their preparation programs and may remove any potential differences that could favor teachers from special education backgrounds. In addition, no differences were found based on years of experience, which may indicate that special education programs have not considered transition services to be an essential part of the preparation of special education teachers even in recent years.

Conclusion and Recommendations

This study was the first Saudi study that explored teachers' perceptions of the preparation they receive to offer transition services for students with intellectual disabilities. The findings indicated that teachers have negative impressions of the transition service training that is provided in their preparation programs. There were no differences in how teachers' perceived their preparation based on gender, educational background, or experience.

This study found that teachers felt unprepared to plan or deliver transition services; thus, transition-related knowledge and training should be incorporated into special education programs in universities. Programs should embed this coursework within all special education preparation programs in all minors. Such departments should also establish new minors within special education programs that qualify special education teachers to be transition specialists to facilitate their supportive role in implementing

transition services. These transition specialist programs should be offered as undergraduate and graduate programs.

Initially, universities should study the various types of transition programs that are already available in some universities and establish new local programs. Teachers who graduated from these programs will earn a transition certificate. Then, they should be able to support teachers and train them to be engaged in transition planning services.

There are number of universities in the US that offer transition specialist programs. For example, the University of North Texas offers a transition specialist certificate in the area of emotional (E) and behavioral disorders (BD). This certificate requires the following four courses: Educational Programming for Children with E/BD (3 hours), Transition of Youth with E/BD: Issues and Practices (3 hours), Advanced Transition Planning for Students with E/BD (3 hours), and Seminar on Traumatic Brain Injury (3 hours). This program is limited to those with a special education bachelor's degree, while some programs are open to all those with relevant degrees in education, such as the program offered by the University of Wisconsin Whitewater. A total of 15 hours is required to finish this program: Career-Vocational Programming (3 Hours), Transition Planning & Programming (3 Hours), Transition Assessment (3 Hours), Collaborative Leadership (3 Hours), Reflective Practice and Action Research (3 Hours), and Applied Action Research (3 Hours).

Universities in general, in Saudi Arabia in particular, should combine some of ideas and policies of these programs and a local program should be developed. For instance, they can adapt the policy to limit these programs to special education teachers, as at the University of North Texas, because they are already working in special education programs, which will help to quickly improve their programs. Until there are adequate numbers of transition specialists, then any program should be open for all graduates from relevant education majors. Another reference is the Council for Exceptional Children's (CEC) Professional Standards that classifies the knowledge and skills required for a transition specialist. Finally, special education preparation programs should work on training special education teachers (teachers in-service) on the basic skills to create a transition plan. They should give the priority to middle and high school teachers. Then, they can expand the training to all teachers working in special education programs.

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TEST ANXIETY RESEARCH: STUDENTS WITH VISION IMPAIRMENTS AND STUDENTS WITH MILD INTELLECTUAL DISABILITIES

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There is an absence of research on test anxiety in students with disabilities although such testing is taken for granted among students without disabilities. This study investigated the test anxiety of the students in each of the two disability groups, those with vision impairments and those with intellectual disabilities who are placed in specialist and mainstream educational settings in South Australia. The Spielberger's Test Anxiety questionnaire which measures two components, worry and emotionality and the total test anxiety was administered to 25 students with vision impairments and 20 students with intellectual disabilities. The findings indicated that among both groups of students, most had high scores in worry, emotionality and total test anxiety. However, students with vision impairments had slightly higher physically fearful symptoms (emotionality) in comparison to cognitive fears (worry) in a testing situation, while exactly the reverse was found for students with intellectual disabilities. The Welch two independent sample t-tests revealed that while there were no significant differences between female and male students with vision impairments, in the Total Test Anxiety, Worry and Emotionality components, the exactly opposite was found for students with intellectual disabilities. The female students with intellectual disabilities were found to be significantly higher than their male counterparts in the Total Test Anxiety, Worry and Emotionality.

Introduction

Asonibare and Olayonu (1997) and Okwilagwe (2001) posited that due to an increase in high stakes testing in recent times, students performed more poorly in academics than what they did in the past. This in turn has led students to experience a considerable amount of stress and anxiety before any examination or tests, resulting in high test anxiety in otherwise capable students (Putwain, 2008). According to Neuderth, Jabs and Schmidtke (2009), in the modern day complex living, test anxiety has been recognised as an increasing problem among students which in turn impede the academic performance in potential students. This problem of anxiety before examinations and low academic achievement is even greater for students with disabilities (Hancock, 2001). Studies have demonstrated that students with disabilities experience greater problems in testing situations than students without disabilities (Bryan, Sonnefeld, & Grabowski, 1983; Heiman & Precel, 2003; Kovach, Wilgosh, & Stewin, 1998; Swanson & Howell, 1996). According to Swanson (2005), students with disabilities are likely to have basic psychological and/or neuropsychological impairments that inhibit their ability to perform well in certain academic areas. Eniola (2007) further emphasised the greater occurrence of low achievement among students with vision impairments due to a number of negative factors prevalent for this cohort of students. Eniola (2007) established a link between higher anxiety levels and vision impairment and purported that this high level of anxiety influenced the academic performance of these students in a negative way. Rees, Tee, Marella, Fenwick, Dirani and Lamoureux (2010) also substantiated that people with vision impairments in Melbourne, Australia experienced high depression and anxiety. Cooray and Bakala (2005) too indicated that people with disabilities, especially intellectual disabilities experienced high anxiety due to an inability to manage and cope with one's condition. When research has established that there is a strong connection between higher anxiety and disabilities, the test anxiety research in students with disabilities is still in its embryonic stage.

This research is aimed to study the nature of and report the prevalence of test anxiety in students with vision impairments and those with intellectual disabilities placed in specialist and mainstream

educational settings in South Australia. It further provides insights into whether there are gender differences in test anxiety in the two disability cohorts under investigation. This study is not aimed to compare the findings in relation to these two groups of students. The two disability groups have their own unique and different characteristics and, therefore, at no stage comparison of the findings between these two disability groups- vision impairment and intellectual disability is undertaken. However, the questionnaire responses for the two disability groups are reported separately with a view to informing professionals and adding to the body of knowledge on these areas in relation to either students with vision impairments or students with intellectual disabilities. The main research questions that emerge from the aims of the study in relation to students with vision impairments and those with intellectual disabilities are as follows:

1. What are the scores of test anxiety and its components for the female and male students with vision impairments and those with intellectual disabilities in South Australia?
2. Are there any significant differences in the scores of test anxiety and its components for students with vision impairments and those with intellectual disabilities with respect to gender?

Method

The Spielberger's Test Anxiety Questionnaire developed by Spielberger et al., (1980) was administered to students in the two disability areas to determine the scores of test anxiety and its components. The Welch independent t-tests were also employed to find out whether there were any significant differences across gender for the two disability cohorts in the scores of test anxiety and its components. According to Creswell (2008), survey designs are procedures in which the researcher administers a survey or questionnaire to a small group of people (called the sample) to identify trends in attitudes, perceptions, behaviours or characteristics of a large group of people (called the population). In this procedure, survey researchers gather numbered data using questionnaires and statistically analyse the data to explain certain trends about responses to questions and to test research questions (Creswell, 2008). They also interpret the meaning of the data by linking the results of the statistical test back to past research studies (Creswell, 2008).

Instrument

The Test Anxiety Inventory (TAI), developed by Spielberger et al. (1980), is the most widely used validated questionnaire for measuring test anxiety and has been employed in the majority of more latest research studies of student test anxiety (Bradley, McCraty, Atkinson, Arguelles, Rees & Tomasino, 2007; Datta, 2013). The TAI provides a global measure of test anxiety as well as a separate measurement of two theoretically relevant components defined as 'worry' and 'emotionality' (Spielberger et al., 1980). Spielberger et al. (1980) as cited in Datta (2013) defined worry as the psychological or cognitive concerns and anxiety about the consequences of failure in a testing situation and emotionality as the physical and bodily reactions experienced by students in a testing situation.

Students used a four-point scale to report how frequently they experienced specific symptoms of anxiety in test situations. The four choices are: (1) almost never, (2) sometimes, (3) often, and (4) almost always. The scoring weights for items 2 through 20 are 1 through 4 and for item 1 it is reverse scored i.e. 4 through 1 (Spielberger et al., 1980 as cited in Datta, 2013). A pilot was conducted on students with vision impairments and those with intellectual disabilities in South Australia prior to the major data collection to test the appropriateness and robustness of the survey questionnaire. The Cronbach Alpha results for Test Anxiety Global was 0.92, for Test Anxiety Worry was 0.87 and for Test Anxiety Emotional was 0.90 respectively (Bradley et al., 2007).

Participants

In this study, adolescent and adult students from all levels of vision impairments were included. The visual acuity of the participants ranged from 6/18 or less (low vision) to 3/60 and less (blindness) and all types of vision impairments (whether it was congenital or adventitious) were included. This study also included adolescent and adult students with only mild intellectual disabilities. Adolescent and adult students with moderate, severe and profound intellectual disabilities were excluded as it would be difficult for them to comprehend the items in the questionnaire and answer independently. These participants were selected by the Purposive Sampling method which is defined as *the researchers intentionally selecting individuals and sites to learn or understand the central phenomenon* (Creswell, 2003, p. 204). These participants were selected from the mainstream and specialist schools and Technical and Further Education (TAFE) Institutes owned and operated by the Government of South Australia. The

schools and TAFE Institutes were contacted by the researcher via telephone or e-mail. A letter outlining the research along with the Ethics Committee's approval documents were sent to the Principal. The names and the contact details of the students were accessed through school and institute records with prior permission obtained from the Principal. Some of the adult students with vision impairments and those with intellectual disabilities were contacted via organisations that provided support to people with vision impairments and to people with intellectual disabilities. Names and addresses were forwarded by the organisations when permission for participation in the study was provided by the participant.

A total of 25 students with vision impairments and 20 students with mild intellectual disabilities completed the Spielberger's Test Anxiety questionnaire. These two student samples were matched in terms of the following characteristics:

3. Age - age range between 15 -18 years for the adolescent students and between 19-25 years for the adult students;
4. Education level - Year 9-Year 12 for the adolescent students and full time vocational courses for the adult students;

Administration

Each individual student was provided with the Spielberger's Test Anxiety questionnaire. The administration setting was comfortable, well lighted, ventilated and free from noise and other distractions as possible. The questionnaire was administered to students with vision impairments and those with intellectual disabilities on a one-on-one basis. This process enabled the researcher to ensure that students answered all the items in the questionnaire.

Upon completion, questionnaires were collected by the researcher to maintain student confidentiality. The Information Sheet and the Spielberger's Test Anxiety questionnaire for the students with low vision was on the enlarged print format and for some blind students it was in the Braille format. The majority of the adult students with vision impairments could sign their name on the Consent Form. If not they made a cross and a witness signed to verify their consent. The questionnaires on the enlarged print format were prepared by the researcher herself and the questionnaires on the Braille format were prepared at the Braille Unit in the school for students with vision impairments where prior contact had been established by the researcher. The Information Sheet and Consent Form for the adult students with mild intellectual disabilities were provided in simple language and the research project was explained to them by the researcher in the presence of a witness. For students in the two disability groups, the items on the Spielberger's Test Anxiety questionnaire was read aloud by the researcher wherever they needed it as administration was on a one-on-one basis. Participation by students was purely voluntary and confidentiality was strictly maintained. This study was approved by the relevant Ethics Committee as well.

Results

Test Anxiety includes the total test anxiety, worry and emotionality scores of the students with vision impairments and those with intellectual disabilities. Based on the Test Anxiety Inventory developed by Spielberger et al. (1980) and according to Datta (2013, para 12), 'the two sub-scales- worry and emotionality and total test anxiety raw scores have been converted into T-scores for the analysis and interpretation. Conversion from raw scores to T-scores for two of the sub-scales-worry and emotionality and the total test anxiety have been provided in the Test Anxiety Inventory on the basis of four distinct sample references namely college undergraduates, college freshmen, community college and high school (Spielberger et al., 1980). The conversion tables for high school and community college were selected for this study. The college undergraduates and college freshmen reference scores were discarded because the samples used in this study did not fall under these categories. The adolescent and adult students who participated in this study were most closely related with the high school and community college cohorts respectively in the Test Anxiety Inventory. All adolescent students who participated in this study belonged to high school and all adult students who participated in this study were attending Technical and Further Education (TAFE) institutes which closely matched adult or community colleges'.

The results are reported here more generally to establish a holistic picture across the components of test anxiety for female and male students with vision impairments and those with intellectual disabilities. The scores (high/ moderate/ low) on the total test anxiety, worry and emotionality components for female and male students with vision impairments are presented in Table 1 below:

Table 1. Frequency of T-Scores Across Test Anxiety Components for Female and Male Students with Vision Impairments (N=25)

Components of test anxiety	Female (N=13)			Male (N=12)			Total (N=25)		
	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low
Worry	77%	15.4%	7.7%	83%	-	17%	80%	7.7%	12.3%
Emotionality	92%	-	8%	83.3%	-	16.7%	87.7%	-	12.3%
Total test anxiety *	69%	23%	8%	66.7%	16.7%	16.7%	67.9%	19.8%	12.3%

*Total test anxiety for each student is not just the arithmetic total of worry and emotionality scores but an addition of scores obtained in another 4 items 'raw to T' scores

Table 1 indicates the overall pattern of responses across the different components of test anxiety for students with vision impairments. In the case of the male students, the highest frequency of high scores was in the emotionality and worry components respectively. In case of the female students, the highest frequency of high scores was in the emotionality followed by worry components. This shows that overall, (male and female students combined) the majority of the students with vision impairments experienced physical reactions (emotionality) together with cognitive fears (worry) when faced with a testing situation; however, physically fearful symptoms were slightly higher in comparison to cognitive fears in students with vision impairments.

The scores (high/ moderate/ low) on the total test anxiety worry and emotionality components for female and male students with intellectual disabilities are depicted in Table 2 below:

Table 2. Frequency of T-Scores Across Test Anxiety Components for Female and Male Students with Intellectual Disabilities (N=20)

Components of test anxiety	Female (N=10)			Male (N=10)			Total (N=20)		
	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low
Worry	90%	10%	-	80%	10%	10%	85%	10%	5%
Emotionality	90%	10%	-	70%	20%	10%	80%	15%	5%
Total test anxiety *	80%	20%	-	40%	60%	-	60%	40%	-

*Total test anxiety for each student is not just the arithmetic total of worry and emotionality scores but an addition of scores obtained in another 4 items 'raw to T' scores

Table 2 presents the overall pattern of responses across the different components of test anxiety for students with intellectual disabilities. In the case of the male students, the highest frequency of high scores was in the worry followed by the emotionality component respectively. In the case of the female students, the highest frequency of high scores was in the worry and emotionality components. These findings reveal that overall, (male and female students combined) the majority of the students with intellectual disabilities experienced cognitive fears (worry) together with physical reactions (emotionality) in a testing situation or before submitting any assignment; however cognitive fears were slightly higher than bodily symptoms for students with intellectual disabilities.

In the sections that follow, the Welch two independent sample t-tests for the students with vision impairments and those with intellectual disabilities on the two components and Total Test Anxiety from the Spielberger's Test Anxiety Inventory are conducted. Since it is an exploratory data analysis, only t-test and not any higher statistical analysis was conducted.

Table 3 indicates that there were no significant differences between female and male students with vision impairments in the Total Test Anxiety, Worry and Emotionality ($p>0.05$).

Table 4 indicates that there were significant differences between female and male students with intellectual disabilities in the Total Test Anxiety, Worry and Emotionality ($p<0.05$). In the two components of test anxiety and Total Test Anxiety, the female students with intellectual disabilities were found to be significantly higher than the male students with intellectual disabilities.

Table 3. Overview of Mean (M), Standard Deviation (SD), T-Value and P-Value of Test Anxiety Across its Two Components and Total Test Anxiety for Students with Vision Impairments with Respect to Gender

Test Anxiety Components	Mean (M) and Standard Deviation (SD)		t-value	p-value
	Female (N=13)	Male (N=12)		
Total Test Anxiety	M = 66.92 SD = 12.11	M = 59.67 SD = 15.17	1.31	0.20NS
Worry	M = 26.08 SD = 5.01	M = 23.58 SD = 5.88	1.14	0.27NS
Emotionality	M = 27.38 SD = 4.91	M = 24.5 SD = 6.39	1.26	0.22NS

NS = Not Significant

Table 4. Overview of Mean (M), Standard Deviation (SD), T-Value and P-Value of Test Anxiety Across its Two Components and Total Test Anxiety for Students with Intellectual Disabilities with Respect to Gender

Test Anxiety Components	Mean (M) and Standard Deviation (SD)		t-value	p-value
	Female (N=13)	Male (N=12)		
Total Test Anxiety	M = 72.3 SD = 10.61	M = 59.7 SD = 8.21	2.97	0.009*
Worry	M = 29 SD = 3.92	M = 23.5 SD = 3.72	3.22	0.005*
Emotionality	M = 29.3 SD = 4.14	M = 24.2 SD = 3.55	2.96	0.009*

*Significant at .05 level

Table 4 indicates that there were significant differences between female and male students with intellectual disabilities in the Total Test Anxiety, Worry and Emotionality ($p < 0.05$). In the two components of test anxiety and Total Test Anxiety, the female students with intellectual disabilities were found to be significantly higher than the male students with intellectual disabilities.

Discussion

This section discusses the key statistical findings that emerged from the questionnaire data in relation to test anxiety in students with vision impairments and those with intellectual disabilities in South Australia. These findings can make a unique contribution to the field of special education as there are no previous studies investigating the test anxiety specifically in these two cohorts of disability, vision impairment and intellectual disabilities.

The majority of the students with vision impairments had high scores in total test anxiety, worry and emotionality components of Spielberger's Test Anxiety questionnaire. This is indicative that these students were anxious, fearful and nervous with the manifestation of higher amounts of physical reactions and cognitive concerns in a testing situation. There were no significant differences between female and male students in total test anxiety and in each of the components of test anxiety.

For students with intellectual disabilities, the majority had high scores in the total test anxiety, worry and emotionality. This implies that these students experienced high cognitive distress and physical discomfort in a testing situation. There were significant differences between the female and male students with intellectual disabilities in the total test anxiety and in the two components of test anxiety namely worry and emotionality; the female students were found to be significantly higher than the male students. This implies that female students with intellectual disabilities were more tense, nervous, anxious and apprehensive before submitting an assignment or performing in an examination in comparison to male students with intellectual disabilities. Female students with intellectual disabilities had greater negative cognitive concerns and physical discomfort in an evaluative situation in comparison to male students with intellectual disabilities. Other research studies found non-disabled female students also experienced higher levels of test anxiety symptoms than non-disabled male students (Cassady & Johnson, 2002; Chapell et al., 2005; Rezazadeh & Tavakoli, 2009; Seipp & Schwarzer, 1996; Trifoni & Shahini, 2011; Wren & Benson, 2004). The present study confirms that students with intellectual disabilities were no exception to the gender specific patterns of behaviour established by students without intellectual disabilities in relation to test anxiety research.

Conclusion

Findings from the research indicate that students with vision impairments experienced greater physical reactions (emotionality) in comparison to cognitive fears (worry). The reverse was established for students with intellectual disabilities. Both cohorts experienced higher amounts of anxiety before and during a testing situation. Therefore, it can be implied that students with vision impairments and those with intellectual disabilities require additional aid and support from teachers, support staff and the school Counsellor before appearing for any examination or test. Professional development for teachers which focuses on deepening their understanding about the condition of any students' disability, and increased awareness of the nature of vision impairment and/ or intellectual disability and the educational implications of these disabilities must be a priority for teachers, families, students with vision impairments and those with intellectual disabilities, as well as other non-disabled peers and society in general.

The present research study investigated the test anxiety in students with vision impairments and those with intellectual disabilities in South Australia. However, students with other kinds of disabilities (e.g. students with hearing impairments, learning disabilities, physical impairments, autism and attention deficit hyperactive disorder) commonly found in the classrooms in Australia were not included in the research. Similar facets should be studied for students with other disabilities as well.

Limitations

This study was limited by the size of the sample that was selected for this study which was restricted by access to an already small population. The data were collected in a State in Australia, which provided few subjects. The sensitivity of the area and the unwillingness of some parents to participate in the study, further limited access to subjects. Because of the low numbers of students with vision impairments and those with intellectual disabilities available for the study, findings were interpreted with care. This study was limited to an investigation of only two groups of students: those with vision impairments and those with intellectual disabilities. However, for the future lines of investigation, the other types of impairments should be studied.

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THE EFFECT OF BRAIN GYM® ON ACADEMIC ENGAGEMENT FOR CHILDREN WITH DEVELOPMENTAL DISABILITIES

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Following recent legislative initiatives in education requiring evidence-based practices, schools have implemented various instructional programs characterized as evidence-based. However, it is important to question whether these methods are truly effective. One example of a methodology currently promoted and used in schools is an educational kinesiology program called Brain Gym®. Brain Gym® is reported to improve various education related skills. The purpose of this study is to investigate the effect of Brain Gym® on academic engagement for children with developmental disabilities. In this study, Brain Gym® was compared to an alternate intervention, simple physical activity, which did not conform to Brain Gym® guidelines. Neither intervention produced consistently positive effects for academic engagement. Based on these findings, it is questionable whether Brain Gym® can successfully be used with children with developmental disabilities to improve engagement. These results can inform the decision-making process of selecting evidence-based practices in education.

In recent years, legislation such as the No Child Left Behind Act of 2001 or the 2004 revision of the Individual with Disabilities Education Act have prompted schools in the United States to begin choosing instructional practices that are evidence-based. However, not all instructional practices are equally effective. Some produce more positive student outcomes than others. It would seem logical that teachers would adopt the most effective practice for classroom implementation. However, it is not always that simple. Research must be conducted in order to determine which programs are effective for different groups of children, including those with developmental disabilities.

The lack of certainty about which programs are evidence-based may leave educators questioning which programs are maximally effective for a particular population. An example of a program currently promoted for use in schools is Brain Gym®. Brain Gym® is an educational philosophy as well as a set of specific physical movements promoted by Brain Gym® International (BGI). These movements are said to lead to optimal learning. According to the Official Brain Gym® Website (Brain Gym International, 2014, para. 3):

Clients, teachers, and students have been reporting for over 20 years on the effectiveness of these simple activities. Even though it is not clear yet ‘why’ these movements work so well, they often bring about dramatic improvements in areas such as:

1. Concentration and focus
2. Memory
3. Academics: reading, writing, math, test taking
4. Physical coordination
5. Relationships
6. Self responsibility
7. Organizational skills
8. Attitude

Brain Gym® is an educational kinesiology program that is promoted and implemented internationally in over 87 countries. Additionally, Brain Gym® materials have been translated into over 40 languages.

According to the Brain Gym International website, introductory training courses in the use of Brain Gym® are available in ten countries (BGI, 2014).

Brain Gym® is an intervention designed by educators and reading specialists, Paul and Gail Dennison, in the 1970s to improve various outcomes including attention, memory, and academic skills. This intervention requires the participants to engage in a variety of movements to help the body recall the movements from the first stages of life when they were learning to coordinate the hands, eyes, ears, and whole body (BGI, 2014). Brain Gym® consists of 26 simple movements that are believed to enhance academic and behavioral performance by activating both hemispheres of the brain through neurological repatterning to promote whole-brain learning (Hyatt, 2007; Dennison & Dennison, 2007). It is purported that by integrating left and right sides of the brain, learning problems, emotional, and psychological stress will be eliminated allowing individuals to optimize their learning experience (Dennison & Dennison, 2007; Spaulding, Mostert, & Beam 2010). While there are many qualitative studies supporting the use of this intervention, few empirical research studies are available. Of the empirical studies available, all show positive effects of Brain Gym®. However, they also have methodological flaws, which obscure the effect of the intervention (Hyatt, 2007). The lack of empirical research as well as methodological flaws in existing research is problematic in determining whether Brain Gym® should be considered evidence-based.

The absence of children with developmental disabilities represented in the existing research also creates a problem when determining whether Brain Gym® may be appropriate for use with children with autism. Of the research studies available, both empirical and qualitative, none were conducted for the purpose of evaluating the program for children with autism (BGI, 2003). Several studies focused on children with Attention Deficit Hyperactivity Disorder or Learning Disabilities. However, children with autism also are in need of interventions in the areas claimed to be improved by Brain Gym®. Autism is generally accepted to stem from biological or neurological differences in the brain (National Autism Center, 2012). According to BGI, engaging in the movements of Brain Gym® causes new neural pathways to grow (Dennison & Dennison, 2007). Therefore, Brain Gym® would be particularly important to evaluate for children with neurologically based disorders such as autism.

Literature Review

Theoretical Foundations

Throughout recent decades, several theories that align with the theoretical foundations of Brain Gym® have been developed and promoted. These theories include, neurological repatterning as put forth in the Doman-Delacato Theory (Doman, 1968), cerebral dominance (Orton, 1937), and perceptual-motor training (Barsch, 1965; Kephart, 1963). These theories promote movement and physical activity in order to *increase concentration, mental cognition, and academic performance* (Mahar et al., 2006, p 2086). According to Mahar et al., (2006) there is evidence that daily classroom-based physical activity increases on-task behavior during instruction.

Empirical Research

While many qualitative studies support the use of Brain Gym®, there is limited empirical evidence to support claims concerning the effects of Brain Gym®. The Official Brain Gym® Website (BGI, 2014) lists research and evidence supporting Brain Gym® and its theoretical foundations. However, most of the evidence is based on anecdotal or qualitative studies, many of which are published in the *Brain Gym® Journal* funded by BGI. Few publications appear in peer reviewed journals. Spaulding, Mostert, and Beam (2010) report that according to the Official Brain Gym® Website *64% of the studies were published in the Brain Gym® Journal or the Brain Gym® Magazine. Only five articles (13%) used an experimental research design...* (p. 23). Hyatt (2007) reviewed all empirical studies from those listed on the Brain Gym® website and only found five articles published in peer reviewed journals. Of those five, Hyatt reviewed only four because the fifth article (Wolfsont, 2002) included one of the research participants as an author.

Four empirical articles on the effects of Brain Gym® were reviewed by Hyatt (2007), Stephenson (2009), and Spaulding, Mostert, & Beam (2010). All four studies have positive findings supporting the efficacy of Brain Gym® activities. However, all four studies also have methodological concerns. Each of the four studies addressed different behaviors. Behaviors targeted include balance as measured by a stork standing task (Khalsa, Morris, & Sifft, 1988), response time (Sifft & Khalsa, 1991), perceptual motor skills (Cammisa, 1994) as measured by the Perceptual Motor Assessment for Children (Dial, McCarron, & Amann, 1988), and test performance (De los Santos, Hume, & Cortes, 2002). While the claims of

Brain Gym® predict improvement in many areas of functioning, it is important to begin to develop a line of research identifying specific areas of improvement in education. Brain Gym® claims to improve broad areas of educational functioning such as attention and focus as well as more narrow areas such as reading, writing, math, and test taking (BGI, 2014). While some work has begun in these areas (e.g. test taking), researchers should systematically measure changes in performance in each area.

Another concern in the existing body of literature is the occurrence of either methodological inconsistencies or the lack of detail in published reports. Methodological concerns include lack of detail on type and amount of training in Brain Gym® procedures provided to teachers (Khalsa, Morris, & Sifft, 1988), no pretest data to establish equivalence of groups (Sifft & Khalsa, 1991), no control group (Cammisa, 1994), and lack of direct measures of behavior (De los Santos, Hume, & Cortes, 2002). The lack of detail on training brings into question the integrity of intervention implementation. Teachers without proper training in Brain Gym® methods may be more likely to implement the intervention incorrectly or inconsistently. The lack of pretest data is also problematic because it makes any differences noted at post-test difficult to interpret. The groups could have already differed prior to the beginning of implementation. Similarly the lack of a control group fails to control for maturation. Any improvements documented could have been due to the participants maturing or the passage of time instead of the intervention. Also, the effects of Brain Gym® are not compared to simple physical activity, which has already been shown to increase on-task behavior in children (Mahar et al., 2006). Finally, the lack of direct measures weakens the argument for meaningful behavioral or academic effects.

Hyatt (2007) stated that due to methodological flaws in these empirical studies, there is no basis for claims made by BGI that Brain Gym® improves academic skills, listening and thinking skills, or learning disability deficits. Although, a large body of qualitative studies provides support for the effects of Brain Gym®, the empirical basis for these effects is lacking. Additionally, the four studies reviewed targeted very different types of outcome measures. The lack of a coherent research base focusing on a common outcome variable limits the consistency of the research as a whole. Moreover, Hyatt (2007) and Spaulding, Mostert, and Beam (2010) question the theoretical foundations of Brain Gym®.

However, even with the inadequacy of empirical support, Brain Gym® is still an often promoted intervention. Stephenson (2009) performed an internet search (using the search terms *BrainGym*, *Brain Gym*, and *School*) to find what was being promoted to teachers and educators in Australia about Brain Gym®. Stephenson found that there were 4,290 website hits. The first 200 were visited to determine which audience was being targeted. Thirty websites and resources were found that explicitly recommended, endorsed, or mentioned Brain Gym® to teachers and educators. Most of these sites offered Brain Gym® as a form of professional development and all of them provided some level of support for Brain Gym® use in schools.

Purpose of the Study

Brain Gym® is an internationally promoted and implemented program with the potential to affect the learning of thousands of children across the world. In fact, Brain Gym International publishes a chronology of research studies (BGI, 2003). This chronology lists several qualitative studies describing the training and implementation of Brain Gym in a variety of locations and cultures such as the United States, India, Indonesia, Canada, and Israel. Although widely promoted and used, Brain Gym® must be tested for effectiveness in various populations. In the United States, children diagnosed with developmental disabilities such as autism receive individualized educational services provided by the public school system. It is important to determine whether Brain Gym® could be used to improve the educational outcomes of these children. This study seeks to provide information that can be used by educators in order to decide whether Brain Gym® is an appropriate intervention for children with developmental disabilities.

Several reviews of the empirical evidence for Brain Gym® (Hyatt, 2007; Stephenson, 2009; Spaulding, Mostert, & Beam, 2010) indicate that there are few empirical studies available. The empirical studies that have been examined contain methodological flaws that obscure the effects of intervention. There is also a lack of research focusing on common outcome variables, thus limiting applicability of the research findings. Although the empirical foundation for Brain Gym® is weak, the weakness is due to methodological flaws or inconsistencies in the research – not evidence of ineffectiveness or harm. In fact, all of the studies reported positive outcomes when using Brain Gym®. Therefore, it is difficult to determine if Brain Gym® activities are evidence-based given the available literature. The purpose of the current study is twofold. First, Brain Gym® will be implemented with children with developmental

disabilities. Second, attempts will be made to correct some of the existing methodological flaws in the literature.

The primary purpose of this study is to empirically investigate the effect of Brain Gym® on academic engagement for children with developmental disabilities. Due to the dearth of information available related to effects of Brain Gym® on academic skills in children with developmental disabilities, this study should be considered exploratory. Therefore, a single subject research design will be used to determine individual patterns of effects over time on a small number of participants. Outcomes of this study will provide a foundation of data to inform the design of replication studies and group implementation.

A further purpose of the current study is to begin to address some of the weaknesses in the existing literature. The common methodological flaws include inconsistent outcome variables, inadequate information on training that teachers received for Brain Gym® techniques, lack of pretest data and control groups, and indirect measures. Each of these will be addressed in the design of the current study. Results of the current study will add to the literature on Brain Gym® and will inform practitioners when determining whether Brain Gym® is an evidence-based practice to improve academic engagement for children with developmental disabilities.

Method

Participants

Participants were recruited from a small university-based after-school program for children with autism and developmental delays in which supplementary academic and vocational instruction was provided. All children receiving academic instruction were included in this study. Those receiving only vocational instruction were not included. The subjects were three males between the ages of seven and nine years old with developmental disabilities. All subjects are referred to using pseudonyms in order to protect confidentiality. Isaac and Aaron were both seven years old with diagnoses of autism. Jason was nine years old with multiple disabilities including oppositional defiant disorder, attention deficit/hyperactivity disorder, and auditory processing disorder. Jason was included in the study because the school psychologist at his school reported that he also exhibited symptoms consistent with an Autism Spectrum Disorder. All participants followed one-step directions and accurately imitated physical movements. Jason and Aaron received reading instruction while Isaac participated in math instruction.

Setting and Materials

Sessions were conducted in a university-based clinic in which each child received one-on-one instruction. Each participant worked in a separate work area that included a table, two chairs, and work materials. Instructional materials used in each session included Corrective Reading ©, Distar Math ©, or teacher-made phonics activities. All intervention procedures were implemented at the students' work area or in the hallway outside of the classroom.

Measures

Academic engagement was chosen as the primary outcome variable because it is a behavior that is necessary in order to benefit from academic interventions, it is a behavior that all three of the participants needed to improve, and it is consistent with the claim that Brain Gym® improves focus and concentration. While previous studies have focused on very specific outcomes such as the response time (Sifft & Khalsa, 1991), perceptual motor skills (Cammisa, 1994), and academic test performance (De los Santos, Hume, & Cortex, 2002), academic engagement is a skill that is applicable to all areas of academic performance and will serve as a foundation for future research. Academic engagement for all subjects was defined as 1) sitting in a chair with bottoms on the chair and feet and chair legs on the floor, 2) eyes oriented toward the instructor or paper/materials, 3) remaining quiet or appropriately responding to instructor's directions or questions; 4) hands either on the table, activity, appropriate utensil, or in lap.

Academic engagement was measured using a 30 second time sample. Every 30 seconds the data collectors recorded whether the child was engaged or not. Data was collected daily during the first ten minutes of academic instruction. The first ten minutes of instruction was chosen because the children typically took their first break after ten minutes. During the break, the children selected from a variety of activities to complete. In order to avoid any break-time activities influencing data, it was determined that data collection would stop prior to the first break. Percentage of intervals with academic engagement was compared across baseline and two interventions for each subject.

The recording procedure was also chosen in response to the need for more direct measures of outcomes within the Brain Gym® literature. While one study reported teacher ratings of academic test performance (De los Santos, Hume & Cortes, 2002), a time sample provides a more direct measure of moment by moment performance and will allow for repeated measurement across days to reveal any patterns in behavior over time.

Design

A single-subject research design was selected in order to monitor data patterns over time for each individual. In order to address the lack of pretest data reported in previous research (Sifft & Khalsa, 1991), a baseline was implemented within the single subject design. Each subject first completed a baseline phase in which no intervention procedures were implemented. This lasted for one to two weeks and served as a type of pretest to which intervention results were compared.

A second flaw in research design reported in previous studies was the lack of a control group (Cammisa, 1994). While single-subject research designs do not include control groups, they do incorporate features to simulate a control condition. In order to do this, an alternating treatments design was chosen. In this design, the intervention of interest (Brain Gym®) is alternated with a second treatment, which serves as a control condition within each participant. These two interventions were randomly alternated across sessions. Whether each participant engaged in Brain Gym® or the control intervention each day was selected based on a coin toss for each session with the requirement that the same intervention could not be selected for more than two consecutive days. This requirement was implemented in order to prevent a participant from going for more than one week without engaging in each intervention.

Using this type of research design, specific patterns of data would indicate whether Brain Gym® was effective or ineffective as compared to the control intervention. Although the effects of Brain Gym® are characterized as *rapid* (Dennison & Dennison, 2007, p. 2), it is unclear in the Brain Gym® training manual (Dennison & Dennison, 2007) whether the effects of Brain Gym® will be immediate or whether the child must experience Brain Gym® over a period of time to see effects. Therefore, two patterns of data could emerge indicating that Brain Gym® is an effective intervention in the current study. First, if the effects of Brain Gym® are immediate, then data during Brain Gym® sessions will produce consistently higher average percentages of engaged time when compared to the control intervention. Alternatively, if the effects of Brain Gym® are cumulative over time, then both the Brain Gym® and the control intervention should show slowly increasing trends over time as the child experiences a cumulatively larger number of Brain Gym® sessions. However, if Brain Gym® is ineffective, then one of two data patterns would emerge. The data for Brain Gym® may overlap with the control intervention so that neither intervention is superior in percentage of engaged time. Alternatively, the percent of engaged time for Brain Gym® may be consistently lower than the control intervention. Data for each participant will be evaluated to determine the effect of Brain Gym® based on these guidelines.

Baseline

During Baseline, subjects were given no instructions and were allowed to occupy themselves with any quiet activity that required mostly fine motor movements (e.g. Play-doh®, games, coloring, and toy figurines). These activities lasted between 8 to 10 minutes prior to beginning academic instruction. During baseline, academic engagement was measured during the first 10 minutes of academic instruction.

Intervention

Prior to intervention, all researchers (including those implementing the intervention) successfully completed the twenty-four hour Brain Gym® 101 training to become certified in conducting Brain Gym® activities. This level of training increases the likelihood that Brain Gym® is implemented as designed and is an improvement over previous studies in which the amount of training in Brain Gym® was not specified (Khalsa, Morris, & Sifft, 1988). The current investigation compared two interventions (Brain Gym® and control) to promote academic engagement among children with disabilities. Interventions took place prior to beginning academic instruction each session.

Brain Gym®. The Brain Gym® intervention consisted of completion of Brain Gym® activities. At the beginning of the session, participants completed four movements. Brain Gym® does not provide a recommended number of activities, therefore, movements were selected so that one movement activity from each category (Midline Movements, Energy Exercises, Deepening Attitudes, and Lengthening Activities) was represented. Some Brain Gym® movements (e.g. Space, Earth, Brain, and Balance

Buttons) were omitted due to controversial placement of the hands on body parts (e.g. tailbone and groin areas; Hatton, 2003). However, all other Brain Gym® movements were included. Sessions were conducted 2-3 days per week for 7-8 weeks depending on subject availability. Subjects chose one of four cards, each with a picture depicting a movement from one of the categories. The instructor led the subject in that activity by describing and modeling the movement. The movement activity was sustained until the subject ceased to engage in the movement, requested to stop, or 30 seconds had elapsed. Thirty seconds was chosen because it is the minimal amount of time recommended for Brain Gym® activities (Dennison & Dennison, 2007). This process was repeated until the subject had chosen all four cards.

Control Intervention

In order to assess whether Brain Gym® was effective, a control intervention was compared. Since engaging in a physical activity has been shown to improve on-task behavior in the classroom (Mahar et al., 2006), it was determined that the control intervention should also include physical activity, but not conform to the Brain Gym® movements. This type of control intervention will allow the researchers to determine if Brain Gym® is more effective than simple physical activity. The control intervention consisted of walking in the hallways outside of the classroom (8-10 minutes). For two of the participants (Jason and Aaron), scavenger hunts were implemented in order to increase motivation to engage in the walking activity. During scavenger hunts the students walked through the hallways until they located hidden items (toys or books). The remaining participant (Isaac) seemed to enjoy walking in the hallways and did not require an activity to increase motivation to participate.

Reliability

Reliability of data collection was obtained for approximately 50% of sessions for each subject by two independent observers. After each session, data from each observer were compared and inter-observer agreement percentages calculated. Inter-observer agreement was measured across all conditions and participants. Inter-observer agreement ranged from 89%-100% with a mean of 95.3%.

Results

Results for each subject are presented in Figures 1 – 3. Academic engagement for Jason (Figure 1) ranged from 20%-50% during baseline with a mean of 37%. Baseline data showed a clear downward trend. During sessions with Brain Gym®, academic engagement ranged from 28%-35% with a mean of 32%. Control intervention data ranged from 0%-51% with a mean of 24%. Both Brain Gym® and control data show an increasing trend over time. Although Brain Gym® had a slightly higher mean, the control data indicate a steeper increase in the trend. By the end of the intervention phase, percent of engaged time during the control intervention had surpassed Brain Gym®. Neither intervention produced substantially better academic engagement when compared to baseline. While the results for Jason do show increasing trends in both interventions, which could indicate a cumulative effect of Brain Gym®, the relatively steeper slope of the control data weakens this conclusion. Conclusions are also weakened due to the small number of sessions completed by Jason. Due to an extended illness causing frequent absences, Jason was forced to end treatment early.

Isaac's baseline data for academic engagement (Figure 2) ranged from 68%-90% with a mean of 79%. Baseline data show a clear downward trend. Academic engagement during Brain Gym® ranged from 68%-98% with a mean of 74%. Data for the control intervention ranged from 51%-96% with a mean of 69%. Brain Gym® data showed no trend with one outlying data point on session 12. Control data increased steadily throughout all sessions. Neither intervention was clearly superior to baseline. While Brain Gym® resulted in a slightly higher mean percentage of engaged time when compared to the control condition, the control data showed an upward trend eventually surpassing Brain Gym® by the end of the intervention period. This seems to indicate that Brain Gym® was ineffective for Isaac.

Academic engagement for Aaron (Figure 3) ranged from 0%-69% during baseline with a mean of 46%. Baseline was variable with no clear trend. Academic engagement ranged from 42%-96% during Brain Gym® with a mean of 63% and a clear downward trend. During the control intervention, data ranged from 58%-79% with a mean of 68% and a slightly upward trend. For Aaron, Brain Gym® resulted in a high percentage of academic engagement in the first session and then decreased rapidly throughout the sessions while the control intervention increased over time with a slight drop in the last session. Neither intervention produced academic engagement substantially higher than baseline. For Aaron, Brain Gym® was ineffective when compared to the control condition.

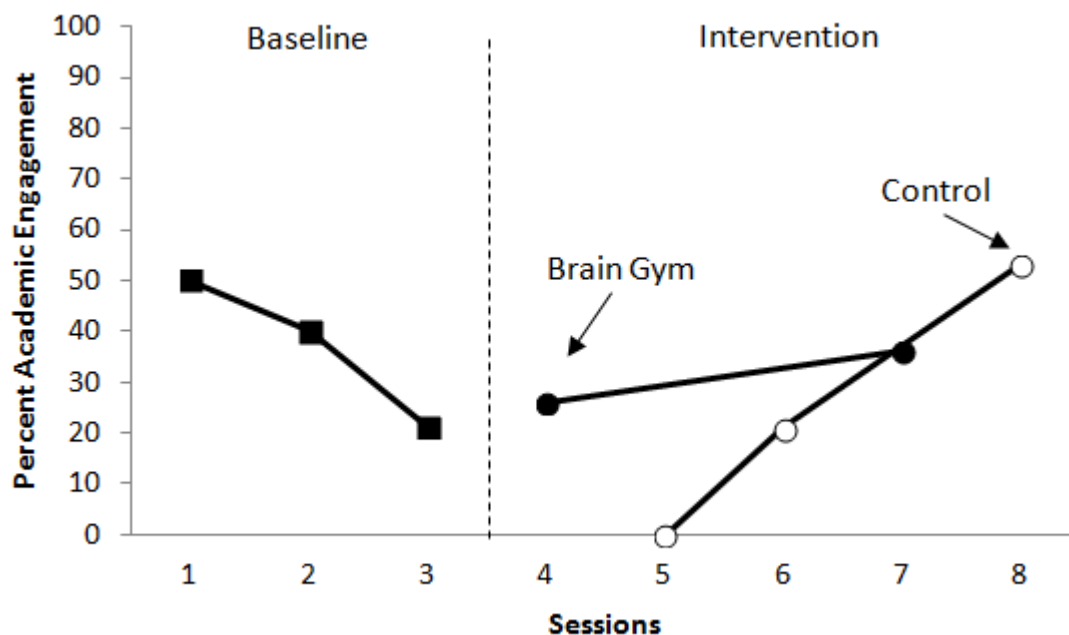


Figure 1: Alternating treatments design for Jason comparing baseline, Brain Gym® and control conditions.

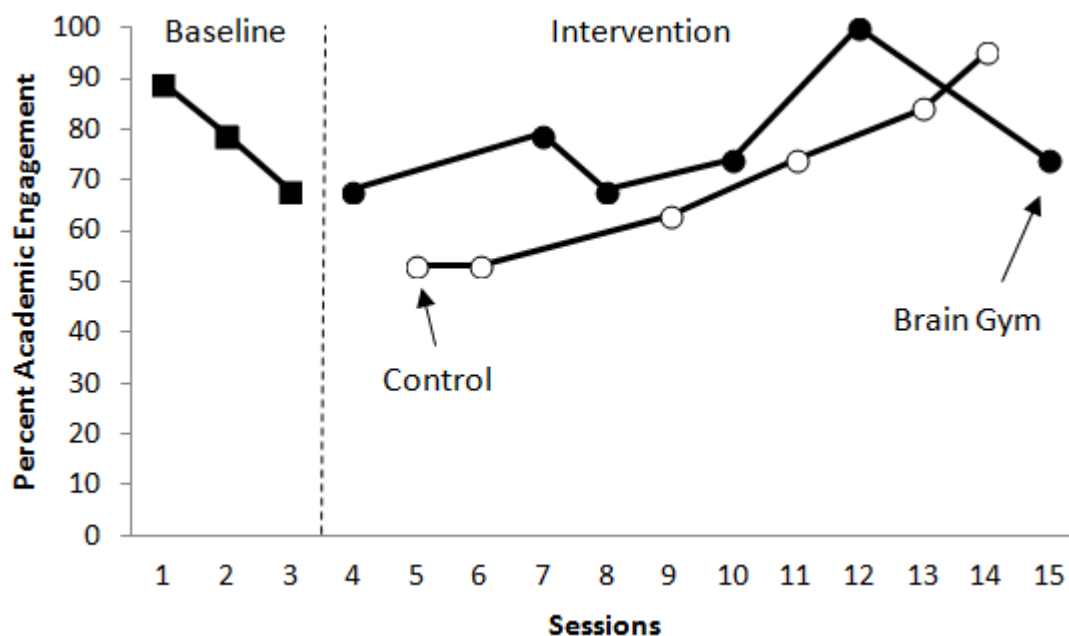


Figure 2: Alternating treatments design for Isaac comparing baseline, Brain Gym® and control conditions.

Discussion

As an internationally promoted and implemented program, Brain Gym® has the potential to impact the learning of children around the world. However, given the time and effort required to implement this program, it is important to verify the effectiveness of Brain Gym®, especially as it relates to children with developmental disabilities. This study provides preliminary evidence in order to help educators make informed decisions when choosing whether to use Brain Gym® for this population.

The results of this study show that Brain Gym® does not produce clear and substantial differences in academic engagement when compared to a control (physical activity) intervention or baseline

(unstructured fine motor activity) for children with developmental disabilities. Since classroom-based physical activity alone has been shown to increase on-task behavior (Mahar et al., 2006), it would be important for Brain Gym® to produce improvements in academic engagement above and beyond simple physical activity in order to prove this intervention to be necessary. However, this was not the case in the current study. In fact, the control condition produced consistently positive trends in academic engagement for all three participants while Brain Gym® only produced a positive trend in one participant who was only exposed to two Brain Gym® sessions.

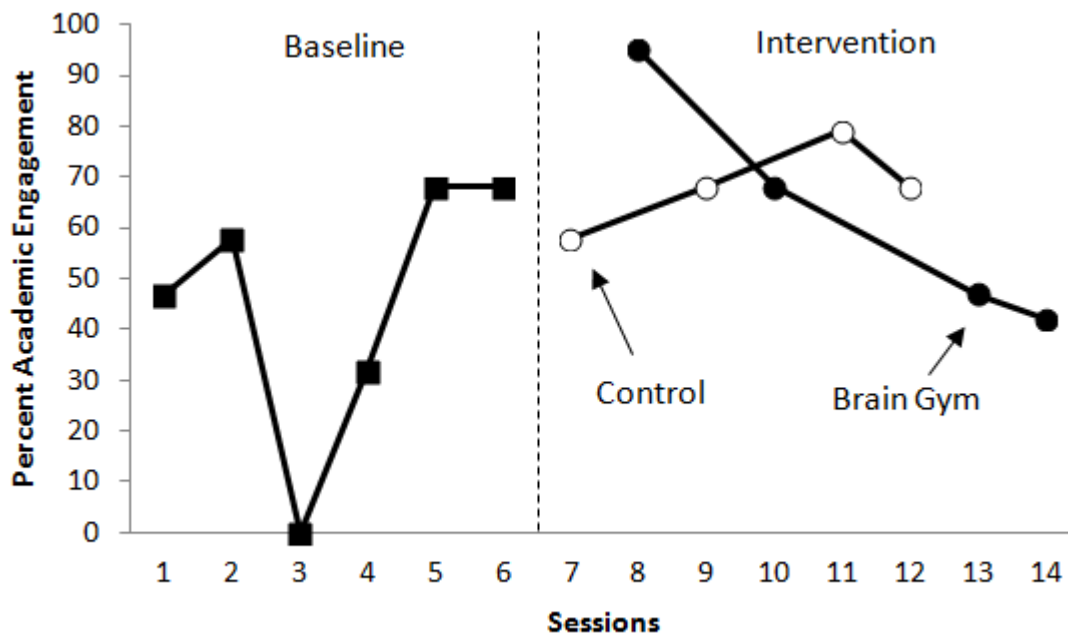


Figure 3: Alternating treatments design for Aaron comparing baseline, Brain Gym ® and control conditions.

In this study, treatment lasted over the course of about two months. Each participant engaged in Brain Gym® up to two times per week and performed four Brain Gym® movements for approximately 30 seconds per movement. While future research should be conducted to assess whether exposure to Brain Gym® over a longer period of time or a stronger dosage may produce effects, there are some obstacles to be overcome first. All three participants showed a lack of motivation to perform Brain Gym® activities. Occasionally, subjects were resistant to performing the Brain Gym® activities. This is especially likely for children with developmental disabilities who may be less fluent at following directions or imitating models. Two subjects (Jason and Aaron) occasionally chose to only perform the activities for a few seconds. Consistent with Brain Gym® methods, the child was allowed to choose the duration of each movement. However, longer durations may have produced different effects. One solution to this problem may be to increase motivation by providing a reinforcer for successful completion of each movement (i.e. stickers). However, the inclusion of reinforcers in the Brain Gym® intervention would fundamentally change the intervention and prevent testing the effects of Brain Gym® as a stand-alone intervention.

While this study fails to support the claims of BGI that engaging in Brain Gym® can produce substantial improvements in concentration and focus, it does provide more detailed information about the effects across time for a small number of participants with developmental disabilities. It also addresses several of the methodological concerns identified in the previous literature. Based on the findings of the current research, Brain Gym® would not be considered an evidence-based practice for increasing engagement in children with autism and other developmental disabilities. These results can further inform teachers, administrators, and policy-makers in the process of identifying evidence-based practices for use in school settings.

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THE EFFECT OF MULTIMODAL REMEDIAL TECHNIQUES ON THE SPELLING ABILITY OF LEARNING DISABLED CHILDREN

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The purpose of the study was to examine the effectiveness of three remedial techniques to improve the spelling ability of students with learning disability. The three techniques, namely, TAK/v, visual orthographic method and listen, speak, read and write (LSRW) method were administered to three experimental groups, each having 13 students with learning disability. The students in the three groups differed in the kind of errors they made in spelling. TAK/v, group, visual orthographic group and LSRW group comprised of dyseidetic spellers, dysphonetic spellers and spellers with mixed errors respectively. The students in the sample had at least average intelligence, manifested specified traits of learning disability, had significant deficits in spelling skills and had no sensorial problems. The results indicated that all the three remedial techniques were significantly effective in ameliorating spelling deficits among students.

Reading and spelling are both part of general language ability. Reading and spelling have been considered as inter-related processes with spelling receiving relatively little attention on its own right. Students with learning disabilities (LD) have been characterized as having severe and persistent writing problems (Graham & MacArthur, 1988). Writing and spelling difficulties have been called dysgraphia or literally abnormal writing.

Recht, Caldwell and Newby (1990) suggested that almost every child who has reading difficulties has similar or even greater problem with spelling. Spelling ability is a powerful characteristic to differentiate dyslexic children from normal learners (Deshler, Schumaker, Alley, Warner & Clark, 1982; Cronin, 1994).

Spelling difficulties among students with learning disabilities is a well documented problem. Historically, spelling has received much less attention in literature on learning disability as compared to reading instruction. In fact, spelling problem in students with learning disability may be more severe than reading disabilities and may have proved more difficult to remediate (Gerber & Hall, 1987; Gettinger, Bryant, & Fayne, 1982).

Initially, spelling is primarily a phonological skill and reading a visual one. By the age of seven and of eight years, the visual and phonological elements become fixed and the child uses both processes that is why at this stage spelling difficulties are noted. To spell correctly one must normally be able to hear a speech, to learn the written form, retain that in one's mind and then recall and reproduce it accurately. Each of these processes involve a number of stages and failure in any one of them will affect spelling performance. A beginning speller should be able to segment spoken words into syllables and phonemes in order to decide, which letters are needed and in which order (Bradley & Bryant, 1983; Maki, Voeten, Vauras & Poskiparta 2001; Schneider & Naslund, 1993; Graham 1999).

Spelling skills must be explicitly taught by considering the technical aspect of handwriting and letter formation, the spelling processes, as well as part of writing process (Graham, 1999). The choices concerning the content of spelling intervention, the application of a specific instructional method, and the learning environment must be interrelated. Methods and learning environment form alternative ways of dealing with the individual needs of a particular student and the content of spelling instruction.

According to Graham teaching phonics to students with learning disability has been an understudied aspect of spelling instruction.

Berninger, Abbott, Whitaker, Sylvester and Nolen (1995) evaluated the effectiveness on an instructional protocol that provided instruction in multi component writing skills. They administered 14 one hour individual tutorials to twenty four third and fourth graders having writing problems. The authors utilized strategy of PWRR (plan, write, review, revise) for handwriting, automaticity, spelling strategies and the composing process. 12 subjects received instruction practice in composing and the other 12 got special training in orthographic and phonological coding. Findings indicated that the treatment groups improved faster on some measures of handwriting, spelling and composition (fluency and quality) as compared to the control group.

Wanzek, Vaughn, Waxler, Smanson, Edmonds and Kin (2006) conducted a synthesis of spelling and reading intervention and their effects on the spelling outcomes of students with learning disability. Spelling outcomes consistently improved following intervention that included explicit instruction with multiple practice opportunities and immediate corrective feedback. Spelling intervention that employed assistive technology aimed at spelling in written composition indicated positive effect on spelling outcomes.

Following the treatment (which was computer based and focusing on learning to recognize and to make use of phonological and morphological structure of words) participant attained an average level of text reading and spelling. The attained level of reading words and reading text was found to be stable over a four year follow up period. Spelling showed a slight decline one year after the treatment, but remained stable thereafter (Tijms, Hocks, Paulussen-Hoogbeem & Smolenaars, 2003).

Boder (1971) studied reading-spelling patterns of children with developmental dyslexia. Boder identified three distinct spelling patterns (errors) dysphonetic, dyseidetic and dysphonetic-dyseidetic (mixed of both types). School teachers admit that children from lower classes have serious spelling errors which undermine reading, understanding and hence gaining knowledge tremendously.

Rationale

Spelling is one curriculum area in which neither creativity nor divergent thinking is encouraged, only one pattern of arrangement of letter is accepted as correct, there is no compromise or leeway. Proficiency of spelling is needed in all subjects in the school curriculum. Though the child may know the answer to a question properly yet due to poor spelling may not be able to convey a clear meaning. Since the problem of making mistakes in spelling pervades of all areas of school curriculum, due to errors he may not be able to communicate what he wants to, most of the time in the school. Hence remediating spelling errors for overall improvement is very important.

The purpose of this study was to investigate effectiveness of various techniques in remedying spelling problems. The study utilized three intervention techniques, viz TAK/v, Visual orthographic and LSRW (listen, speak, read and write).

Methodology

The following section deals with the design, tools, sample selection, procedure of data collection.

Design:

Tools & Techniques: A variety of tools were used in this study. Some of the tools were used to identify and select the required sample. These are DTLD (Diagnostic Test of Learning Disability, Mehta and Swarup, 1993), Intelligence Test (Raven, 1997), Teachers Referral Form and Diagnostic Spelling Test (Gupta & Narang, 2005). Classroom observations of children also used to observe behaviour of the children with learning disability. The intervention technique used were TAK/v, Visual orthographic and LSRW (listen, speak, read and write) method.

Sample: The sample included 41 learning disabled children, identified from 561 regular school going children of 4th standard, having average or above average intelligence, manifesting specified traits of learning disability (Traver & Hallahan, 1976) and significant deficits in their spelling skills as compared to their classmates, having a discrepancy in performance in English and Maths (above .6Z), having a score on a diagnostic test of LD above a cut off and having no sensorial problems.

By using these criteria, a total of 41 students were identified as learning disabled. Classification of children into three groups was based on the kind of errors namely dysidetic (phonetic) dysphonetic (visual) and mixed group having both kinds of errors (Boder, 1971). The above process yielded following distribution of subjects Dysidetic=13, Mixed=14, Dysphonetic=14. After two sessions, two children dropped out, one each from mixed and dysphonetic groups. This made all groups equal in size.

Procedure of Data Collection: Each child was taken individually for treatment. From the compiled list of words misspelled by a child, words were taken one by one for remediation. List of misspelled words for each child was different. On an average three words (selected from list of words misspelled by a child) per day were taken for remediation as advised (Bryant, Donahue, & Pearl 1981; Gordon, Vaughn & Schumm, 1993). Each child attended a session for 20 to 25 minutes daily for remediation as suggested by McNaughton, Huges and Clark. (1994). A word was considered learned when a child produced it correctly three times in a sequence. With some children, words had to be repeated next day, whereas others began with new list of words next day.

Techniques: The present study utilized three different remedial techniques, one each for Dysidetic spellers, Dysphonetic spellers, and Mixed spellers. Each group of spellers underwent 35 sessions of remedial work.

(a) *TAK/v for Dysidetic spellers (phonetic group):* Students with this problem read and spell--primarily through phonic analysis. They have strength in phonic analysis (highly phonetic).

The researcher pasted sand paper cut outs of words on a piece of chart paper. Then she made subject's finger, trace it while saying each part of the word loudly, emphasizing phonemes in the word, with subject's eye closed.

Later, subject on his own, traced each part of the word with eyes closed while uttering the said word. After that subjects wrote the word on a piece of paper with eyes open. If attempt was found incorrect, then subjects were allowed to repeat the same technique. (Larger words were broken into syllables, which were read out to the subject for subject to repeat whole process. The child attempted the whole word at the time of recall).

Modalities used were auditory, tactual and kinesthetic. The visual modality was deflected at the learning stage.

(b) *Visual orthographic method for Dysphonetic speller (visual group):* This method evolved by avoiding phonics based instruction and emphasized orthographic (visual) leaning strategies (Recht, Caldwell & Newby, 1990). Self correction through modeling is an orthographic strategy (Gonschow, 1983).

Researcher prepared three sets of each alphabet in sand paper of 1" size and made flashcards of selected words. Then the subject visually noted the pattern of spelling of that word on the flashcard for approximately 25 seconds and the subject was required to locate the alphabets to make the word from a pile of letters.. After locating, the subjects arranged the letters to make the word shown on the flash card. The letters thus arranged were compared by the student with the word on the flash card shown once again. The subject was allowed to reattempt, when error existed.

Modalities used were visual and motor. The method was morphology based.

(c) *Listen, speak, read and write method (LSRW) for mixed group:* The subject carefully listened to the word called out by the researcher. Then the subject repeated the word, orally and the researcher showed the flash card bearing the word for the subject's silent reading. The subject wrote the word spelling, saying each letter of the word loudly. When the error existed the whole process was repeated.

Modalities used were auditory, visual, vocal and motor. The method utilized both morphological and phonological bases of spellings.

Phases of data collection:

A pre-test in spelling before the onset of experiment and a similar test at the end of the treatment period (post test) were administered to the subject . Two more sets of observations of delayed post tests were

made (DPT1 and DPT2), 21 and 46 days after the post test respectively, to examine stability of improvement, if any.

Results

Fig. 1 Pre-test and post test scores depict a major increase in scores from pre-test to post stage. Minimum score of subjects at post test stage is more than maximum score of subjects at pre-test stage, which implies improvement.

Mean score of post test and DPT1 of all P, V, M groups' shows stability of treatments. Mean scores of DPT1 and DPT2 shows that groups have not deteriorated their performance implying the stability. There is slight tendency of visual group to score more all through.

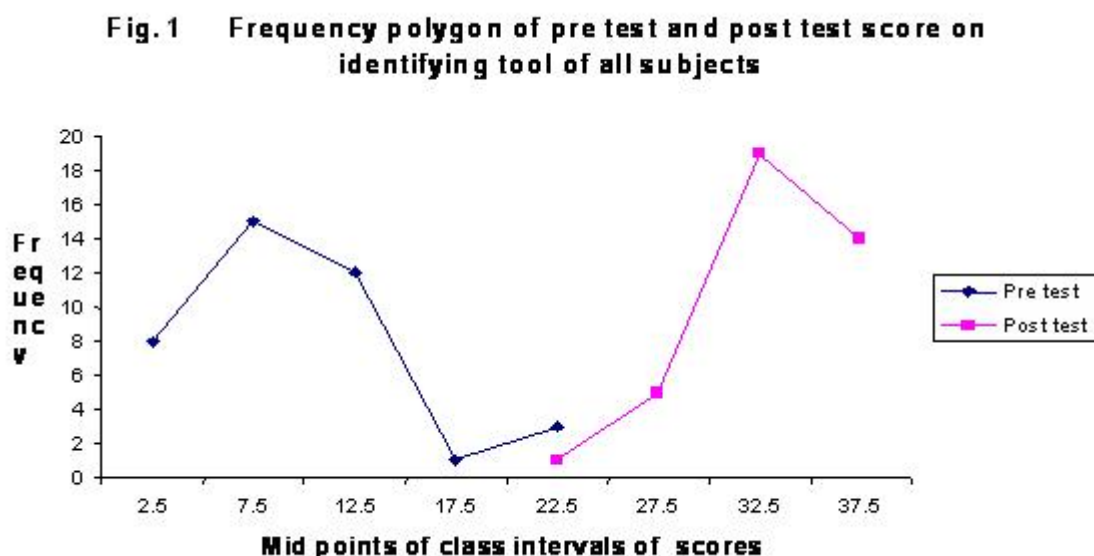


Figure 1: Frequency polygon of pre test and post test score on identifying tool of all subjects

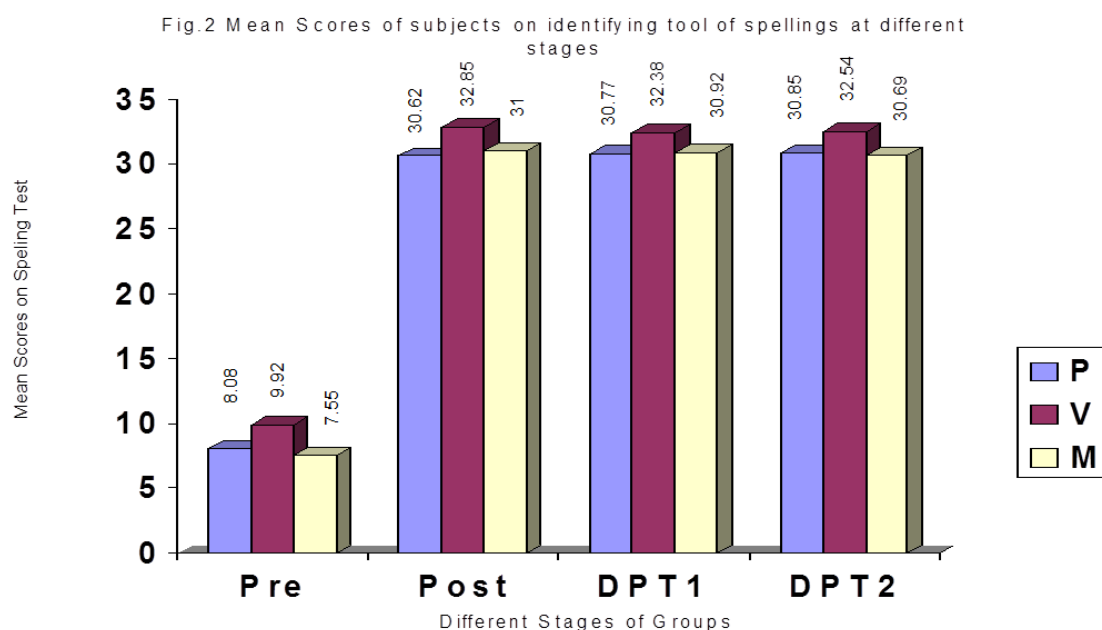


Figure 2. Mean Scores of Subjects on Identifying tool of spellings at different stage

ANOVA results of pre-test scores of three experimental group shows that F-ratio was not significant ($F_{2/36} = 0.80$, $P > 0.05$). This indicates that scores of three groups did not vary from each other significantly. This provides an ideal condition of equality before subjects enter into experimental treatment for comparisons.

When ANOVA on all the data with 3x2 (groups & stages of testing) factorial design with repeated measures on second factor was employed, F-ratio obtained on treatment (groups) was found insignificant ($F_{2/36} = 1.91$, $P > .05$) Group as variable was not causing any significant variation. F ratio for stages of testing (pre to post) was found significant ($F_{1/36} = 267.49$; $P < 0.01$) which indicated all the groups improved significantly at post test. This is supported by the studies of Darch and Simpson (1990) and Darch (2002) who found significant improvement in spellings of LD children.

When ANOVA on gain scores in groups was conducted the F-ratio obtained was insignificant ($F_{2/36} = .11$; $P > 0.05$). This implies that the remediation in groups does not cause differential gains. They have gained equally and the three techniques have worked equally well, and were suited to the respective groups.

Phonetic group

The analysis of data revealed that phonetic group after treatment improved significantly ($t\text{-ratio} = 15.03$; $P < 0.01$). Strategy TAK/v given for dyseidetic spellers of phonetic group was useful for remediating spellings of learning disabled children.

Blau and Loveless (1982; Gupta and Pavri (2000) taught children with spelling disability while using TAK/v method. Both the studies found similar results. Research studies using emphasis on alphabetic phonetic multisensory instruction (Larsen & Hammill, 1986) analysis (Smith, 1998) and segmenting and blending for bad spellers (O'Conner & Sharon, 2000) found similar significant improvement in spellings. Syllabication (Diveta & Speece, 1990) leads to improvement in the spellings of dyseidetic group.

Phonemic awareness can be learned and children can benefit from direct instruction in phonemic awareness and systematic phonics (Armbruster, Lehr & Osborn, 2001). Similarly phonological awareness and phonological processing play a positive role in list memory and word reading (Gray, 2006).

Visual group

The $t\text{-ratio}$ ($t = 16.61$; $p < .01$) for visual group indicated that there was a significant difference between pre test and post test means of visual group. Visual group subjects benefited from the visual orthographic technique, which is corroborated by the findings of Curley and Reilly (1983); Lovett, Warren, Ransy and Dorden (1987) and Maver and Kamhi (1996). These studies made visual inputs available to learners. Gupta and Pavri (2000) showed improvement when subjects were exposed to visual inputs (VAKT group) though not as much as in TAK/v group. Bansal (2005) indicated visual modality benefited in developing strategic and visual thinking skills.

Mixed group

The $t\text{-ratio}$ ($t = 18.6$; $p < .01$) for a difference in pre-test and post test scores for mixed group was found to be significant. Mixed group has benefited from the LSRW treatment (non specific group). This result is in agreement with the findings of Thorpe and Borden (1985), Singh, Farquhar and Hewett (1991). Graham and Freeman (1986) taught learning disabled children a five step strategy (say and write a word, say and check the word, trace and say the word and write it) and Dalvi (1994) taught with write say method and these studies found similar results.

Discussion

All the remedial techniques have made a notable difference. The increased confidence of the disabled students and their willingness to perform during treatment was quite marked. The goal for students in this program is for them to reach their grade level. Techniques administered to the groups were designed on the basis of nature of errors. All the groups used more than one modality. The findings imply the suitability of modalities used for each group of the learning disabled.

Since vision dominates (Posner, Nissen & Klein, 1976) and visual imagery instruction facilitates learning to spell (Robert & Ehri, 1983), subjects surely relied upon visual modality only to receive the

stimulus in visual and mixed group. That is why both the group improved effectively with the techniques.

Tactual/ kinesthetic modality were utilized only in phonetic group to receive stimulus to supplement the inputs from auditory modality and the two kinds of inputs proved to be congenial to each other. Tactual kinesthetic modality has been absent in visual and mixed group. Subjects still improved comparably to other groups. It is yet to be seen, had these inputs been available, would it enhance performance or prove detrimental or redundant?

Emphasis of morphology in dysphonetic and phonology in dyseidetic group proved useful. This amply illustrates that the techniques evolved were appropriately designed to suit the modality preferences and differences of three experimental groups of the present study.

The results of the study are limited by the facts that this was a small scale investigation since the sample size was small. This study is very much significant for special educators, teachers and parents, as in this study an effort has been made to see the effectiveness of training in very important area, which has a direct bearing upon the education of children.

In the present research authors have developed a new technique i.e. visual orthographic method for dysphonetic also. The study has examined the effectiveness of three remedial techniques, TAK/v for Dyseidetic spellers, Visual orthographic methods for Dysphonetic spellers and Listen, speak, read and write method (LSRW) for Indian childrens with spelling disability.

The learning during remedial strategies sustains for a long time. This inference also reflected in other subjects in general. Since focusing on remediation has multiple outcomes, it must be attempted seriously. For further research following suggestion could be undertaken:

Development of assessment devices for diagnosis of individuals with learning disabilities can be undertaken, identification tool used to assess can be larger. Wider sample of spelling with different combination of vowels, consonants and diphthongs can be included to access the disable children.

All the phonetic, visual and mixed group can be treated with all the 3 techniques. If sample would be larger, generalizations would be better. Control group should be included to see the comparison of group.

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THE GROSS MOTOR SKILLS OF CHILDREN WITH MILD LEARNING DISABILITIES

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Many international studies have examined the gross motor skills of children studying in special schools while local studies of such nature are limited. This study investigated the gross motor skills of children with Mild Learning Disabilities (MLD; n = 14, M age = 8.93 years, SD = .33) with the Test of Gross Motor Development-2 (TGMD-2, Ulrich, 2000). The TGMD-2 consists of 12 items equally divided into two subtests (locomotor and object control). The locomotor subtest includes run, gallop, hop, leap, horizontal jump and slide while the object control subtest includes strike a stationary ball, stationary dribble, kick, catch, overhand throw and underhand roll. The results revealed significant differences in 8 out of 12 test items: gallop, hop, leap, horizontal jump, slide, strike, dribble and roll at mastery level between children with MLD and TGMD-2 norm population. The authors suggest motor interventions for children with MLD to improve their gross motor skills.

Introduction

Background of Special Education in Singapore

In Singapore, about three percent of the annual births requires early intervention services where the Child Development Unit (CDU) at Kangkar Kerbau Women's and Children's Hospital (KKH) and National University Hospital (NUH) receive most of the referrals of between 1200 and 1400 annually (Ho, 2007). Children with Mild Learning Disabilities (MLD) could be amongst these children with special needs who receive early intervention services. When these children with MLD in Singapore grow up, the majority of them study in special schools, although some could be included in regular schools. To ensure better integration or inclusion of these children with MLD, the Ministry of Education (MOE) has provided various strategies and policies including the employment and training of Allied Educators (AEDs). Given this support, the possibility of including more children with MLD in regular education becomes a reality. Hence, as more children with MLD integrate into regular classrooms, the understanding of their motor performance becomes increasingly necessary.

Internationally, researchers have recognised the close relationships between cognitive, physical and motor development (Bjorklund & Brown, 1998; Diamond, 2000). Local researchers have also advocated and supported that child development should be viewed from a holistic approach and explored the domains of cognitive, social and emotional and the physical (Chia, 2009). The motor skills of children with MLD as the focus of this proposal are classified under the physical domain of child development. Drawing from the number of infants born with these disabilities and the potential of those who can be included in regular classrooms, an understanding of their motor skills and how this affects their performance in gross motor tasks is warranted.

Presently, the motor abilities and physical fitness of children with MLD in Singapore are not known to be documented. Further, whether there are motor intervention programmes and/or movement programmes for these children with MLD in Singapore remains unclear as well. Therefore, the understanding of the effect of motor intervention programme on the motor performance of children with MLD will add on to the existing body of knowledge both locally and internationally.

The 'No Child Left Behind Act' of 2001 (No Child Left Behind [NCLB], 2002) has triggered worldwide attention for Special Education. More recently, the issue of including children with special needs into Singapore mainstream schools has received tremendous focus which is a shift towards making provisions for special educational needs in Singapore (Nonis, 2006; Teo, 2004). In 2005, Singapore has too,

emphasised the NCLB (2002) policy, and launched the ComCare Fund⁴ to ensure *no Singaporean is left behind*. The ComCare Fund in Singapore aims to help every child grow and develop. Hence, this study aligns with the ComCare Fund by providing information of the motor performance of the children with MLD in the physical domain.

Since children with MLD included in regular education would also be included in regular Physical Education (PE) lessons and for them to enjoy PE lessons together with their typically developing peers, there is a need to ensure effective opportunities to develop their gross motor skills in planning for physical fitness programmes and PE lessons. It is then more important to plan suitable motor intervention programmes and/or physical activities for children with MLD to overcome their difficulties in sporting activities. In this way, children with MLD can achieve developmentally appropriate motor performance which is necessary to complement successful integration in Singapore.

The Gross Motor Skills of Children with Typical Development

The Test of Gross Motor Development-2 (TGMD-2, Ulrich, 2000) has been used extensively to assess the motor performance of children with typical development. Internationally, Pollatou, Konstantina and Karadimou (2005) assessed the gross motor skills performance of 95 preschool children (50 girls, 45 boys; *M* Age = 5.4 years old) and revealed no gender difference.

Sanders and Kidman (1998) investigated elementary school children (*n* = 225, 123 girls, 102 boys, *M* age = 10 years old) and reported none of the 225 children had mastery level (matured form) in all 12 test items of the TGMD-2 (Ulrich, 2000). Less than 50% of the girls had attained mastery in nine out of 12 test items. These include strike (6.5%), bounce (46.3%), kick (1.6%), overarm throw (6.5%), gallop (18.7%), hop (46.3%), leap (49.6%), jump (17.9%) and skip (46.3%). The three most developed test items attaining mastery by the girls were slide (94.3%), catch (80.5%) and run (72.3%). For the boys, less than 50% had attained mastery in six out of 12 test items. These include strike (39.2%), kick (12.7%), overarm throw (40.2%), gallop (18.6%), jump (12.7%) and skip (43.1%). The three most developed test items with mastery by the boys were slide (89.2%), bounce (76.5%), catch (74.5%) and run (73.5%). However, 82.2% of children were either classified as poor or very poor in overall FMS where only two boys had attained mastery for five object control skills and only two girls had attained mastery for seven locomotor skills. None of the boys attained mastery for all locomotor skills and none of the girls attained mastery for all object control skills. Significant gender difference found in object control and locomotor skills where the boys excel in both areas as compared to the girls. The poor FMS performance of these elementary school children could pose several problems for PE teachers in later years (Sanders & Kidman, 1998). Sanders and Kidman (1998) highlighted the consideration of developing FMS in physical activity programmes and revising training practices during the children's involvement in community sporting clubs.

Choi Tse (2004) conducted a preliminary study on the gross motor performance of Hong Kong Chinese children (*n* = 90, 45 boys, 45 girls, age range: 6 – 8 years old) using TGMD-2 (Ulrich, 2000). Only 1.1% (*n* = 1) and 27.6% of the children achieved above-average (above 75th percentile) and average (within 25th – 75th percentile) level of performance respectively. The majority of the children performed below TGMD-2 norm with 27.6% and 40% of them attaining below-average (within 10th – 25th percentile) and poor (below 10th percentile) level of performance respectively (Choi Tse, 2004). No significant gender difference was found. But age differences were found in *dribble* and *overhand throw*. Nearly 50% of the children achieved mastery in the slide (*n* = 59), run (*n* = 45) and dribble (*n* = 41) skills. The most under-developed skills exhibited through least number of children achieving mastery were the hop (*n* = 2), catch (*n* = 10) and underhand roll (*n* = 10) skills. Choi Tse (2004) suggested skills with poor mastery would need more attention during PE lessons. Seven skills which needed more attention were gallop, hop, leap, jump, catch, kick and overhead throw. Choi Tse (2004) recommended the use of TGMD-2 to assess the quality of gross motor skills of children would help identify the matured skills and the problems of motor behaviours for better teaching strategies and PE activities.

Wong and Cheung (2006) evaluated the gross motor performance of Hong Kong Chinese children (*n* = 1251, 692 boys, 559 girls, age range: 3 – 10 years old) and reported gradual increase over age was shown in terms of raw scores for both boys and girls in both locomotor and object control subtests. Among the 12 test items, the locomotor and object-control skills with the highest mastery levels were run (67.8%) and kick (37.1%) respectively. The most underdeveloped locomotor and object-control skills were hop (5.3%) and overhead throw (5.4%) respectively. In reference to the children at eight (*n* = 89) and nine

years old ($n = 108$), the percentage of their skill mastery for the 12 test items were hop (9.0% & 12.0%), slide (74.2% & 67.6%), gallop (77.5% & 74.1%), jump (78.7% & 80.6%), leap (42.7% & 72.2%), run (96.6% & 88.9%), dribble (46.1% & 47.2%), kick (36.0% & 59.3%), catch (18.0% & 10.2%), throw (13.5% & 7.4%), roll (3.4% & 14.8%) and strike (37.1% & 38.9%). Overall, the mastery level of gross motor skills improved with age. Wong and Cheung (2006) concluded that the performance of their object control skills was poorer than the norm TGMD-2 data of same age and gender but not for locomotor skills. Wong and Cheung's (2006) findings highlight the need for more instructional programmes designed for object control skills.

The Gross Motor Skills of Children with Special Needs

The TGMD-2 (Ulrich, 2000) was also used to assess children with special needs (Lieberman, Volding & Winnick, 2004; Simons et al., 2008). Simons et al. (2008) have evaluated the validity and reliability of the TGMD-2 (Ulrich, 2000) on Flemish children with mild intellectual disability ($n = 99$; age range: 7 – 10 years old, 67 boys & 32 girls; Total Intelligence Quotient [TIQ]: 52 – 70) and reported the TGMD-2 tool as a reliable instrument for assessing children with mild intellectual disability. In Simons et al.'s (2008) study, the Gross Motor Quotient (GMQ) of the Flemish children was performing significantly poorer than the TGMD-2 norm population ($p < .001$). Specifically, the Flemish children scored a lower GMQ ($M = 76.67$, $SD = 13.46$) of which the descriptive ratings according to TGMD-2 (Ulrich, 2000) indicated that these Flemish children were performing at a *poor* level for the 12 test items. By comparison, the GMQ of the TGMD-2 norm population ($n = 1208$) was higher and at an *average* level ($M = 100$, $SD = 15$). In addition, the authors reported a low significant age effect for the object control skills only (Simons et al., 2008). Furthermore, a significant poorer performance in the Flemish children was observed when their results were compared with the TGMD norm population (Simons et al., 2008).

Lieberman et al., (2004) investigated 29 children with HI ($n = 27$; 11 girls, 18 boys, M age = 6 years, age range: 4 – 9 years) using the TGMD (Ulrich, 1985). Lieberman et al., (2004) compared the motor development of children with HI who have non-hearing parents ($n = 14$) with those who have hearing parents ($n = 15$). The results revealed age as a significant factor for both locomotor and object control skills. In general, a higher percentage of children with HI had either reached or surpassed average performance levels in object control skills compared with locomotor skills.

Studies involving motor intervention programmes have shown that children with poor motor skills improve post intervention (Larkin & Parker, 2002; Revie & Larkin, 1993; Valentini & Rudisill, 2004). Revie and Larkin (1993) implemented a task-specific intervention (60-minute x 8 weeks) on children identified as poorly coordinated ($n = 21$, age range: 5 – 9 years) in an attempt to improve their motor skills commonly used for daily physical activities. Selected motor skills were distance throw, target kicking, volleyball bouncing-and-catching as well as distance hopping. With the exception of distance hop, pre- and post-test results using TGMD (Ulrich, 1985) revealed significant improvements in all motor tasks ($p < .05$). The authors concluded that intensive task-specific training (with specific instructions, guidance & feedback) was useful to teach children with motor learning difficulties who usually had problems in balance and coordination (Revie & Larkin, 1993).

Valentini and Rudisill (2004) also examined how students (Age range: 5.9 – 10.9 years) with and without disabilities benefit from an inclusive mastery climate intervention. In Valentini and Rudisill's (2004) study, a mastery climate focuses on the child in which the teacher is the facilitator. In their study, participants were randomly distributed into intervention (19 participants with disabilities & 31 participants without disabilities) and comparison groups (17 participants with disabilities & 37 without disabilities). Participants performed the TGMD-2 (Ulrich, 2000) before and after the intervention. The results showed that children with and without disabilities who received 12 weeks of intervention demonstrated significant improvement in motor skill performance from pre- to post- intervention. However, the control group who did not receive intervention did not show any significant improvement in motor skill performance. These findings suggest that the mastery climate intervention provided similar learning opportunities for children with and without disabilities (Valentini & Rudisill, 2004).

This study aimed to understand the gross motor skills of children with MLD and examine the differences in their motor performance as compared with the TGMD-2 norm population (Ulrich, 2000). This study is then be useful to stakeholders (i.e. Schools, Teachers, Educators, Counsellors, Therapists, Parents, Caregivers) in the field of mainstream and special needs education as the data collected will also provide insights to the motor abilities of children with MLD in special schools in Singapore.

Method

Participants

A total of 14 children with MLD ($n = 14$, M age = 8.93 years, $SD = .33$; see Table 1) participated in the study. MLD is defined as having the Intelligence Quotient of less than 70 ($IQ < 70$). Informed and voluntary consents from parents and school to conduct research were obtained. Ethics clearance was obtained from Institutional Review Board (IRB) of Nanyang Technological University (NTU).

Table 1. Age and Gender of Children with MLD (n=14)

Gender	n	Min.	Max.	M	SD
Male	10	8.50	9.50	8.90	0.00
Female	4	9.00	9.00	9.00	0.39
All	14	8.50	9.50	8.93	0.32

Instrument

The TGMD-2 (Ulrich, 2000) was used to investigate the motor performance of children in this study. The TGMD-2 examines the gross motor development of children from age 3 years, 0 months to 10 years, 11 months (Ulrich, 2000). The TGMD-2 consists of 12 test items equally divided into two subtests (6 locomotor test items & 6 object control test items). The locomotor subtest includes run, gallop, hop, leap, horizontal jump and slide while the object control subtest includes strike a stationary ball, stationary dribble, kick, catch, overhand throw and underhand roll. The TGMD-2 instrument was selected for its reliability (large normative sample), suitability (same age group and gender ratio) and short assessment duration (20 minutes per subtest, Ulrich 2000). Each test item includes four to five performance criteria to describe the performance qualitatively.

Procedures

This study was conducted in school during the PE lessons of the participants. Prior to testing and data collection, rapport building with the participants, logistics preparation of the test venue and equipment set-up according to TGMD-2 requirements were carried out to allow familiarization and to reduce any possible anxiety amongst the children. Each child was tested individually in appropriate sportswear with covered shoes. Rest periods were provided between trials for all tasks.

Standardized verbal instructions were used for each motor skill of the test items. The tester demonstrated every skill to each participant twice before each trial. The participants were then given the chance to perform each skill twice in a sequence of run, gallop, hop, leap, horizontal jump and slide. The tester observed the performance of each participant and awarded a score of '1' when the participant performed the test items according to the performance criteria of the skill. A score of '0' was awarded when the participants did not meet the performance criteria of the skill. The duration of each subtest took no more than 20 minutes.

Data Analysis

The raw scores computed from the test protocols of the TGMD-2 motor tasks were summed as per task and converted into standard score, percentile, age equivalents and GMQ according to the age appropriate norm tables provided in the TGMD-2 manual (Ulrich, 2000). Individual standard score of each TGMD-2 gross motor task of the participants were used for further statistical analysis. Data were calculated and analysed using the Statistical Package for Social Science (SPSS version 16.0[®]). The tests used were Mann-Whitney test, Kruskal-Wallis test and one-sample binominal test. The level of statistical significance was set at $p \leq .05$.

Result & Discussion

Age Equivalent & Chronological Age

The results showed that the children with MLD were performing below-norm for both object control and locomotor skills when compared with the age equivalents of the TGMD-2 normative sample (see Table 2). While the mean chronological age of all children with MLD was 8.93 years, both their object control and locomotor skills showed that they were performing at an age equivalent of 4.86 and 4.09 years respectively (see Table 2). The descriptive ratings indicated that these children with MLD were also performing at *very poor* level for the 12 test items (see Table 2). As the results further showed

insignificant age and gender differences within the participants using the Mann-Whitney and Kruskal-Wallis tests ($p > .05$), this would suggest that the children with MLD in this study, exhibited motor proficiency which were below their chronological age. Poor overall motor performance has also been reported in another study (Simons et al., 2008). The findings of this study suggest that poor motor performance with an intervention programme as reported in other studies (Revie & Larkin, 1993; Valentini & Rudisill, 2004) could be useful to improve the motor performance of children with MLD.

Table 2. Comparison of TGMD-2 Performance Using Age Equivalent and Chronological Age

N	<u>M age equivalent</u>	M Age	Standard Score	GMQ	Percentile	Descriptive ratings
	Object control subtest	locomotor subtest				
14	4.86	4.09	8.93	7.14	61.3	<1 very poor

Skill Mastery

The percentages of master level of both children with MLD and the TGMD-2 norm population were compared using the one-sample binominal test. The results showed significant differences between children with MLD and the TGMD-2 norm population in terms of mastery level for Gallop, Hop on preferred leg (Hop P), Hop on non-preferred leg (Hop NP), Leap, Jump, Slide, Strike, Dribble and Roll ($p < .05$; see Table 3). Specifically, the results indicate that the mastery level of the children with MLD was significantly lower in five out of six locomotor test items as compared with the TGMD-2 norm population ($p < .05$; see Table 3). However, the mastery level of the children with MLD was significantly lower in three out of six object-control test items ($p < .05$; see Table 3). This finding suggest that in developing a motor intervention programme for children with MLD, the skills of Gallop, Hop, Leap, Jump, Slide, Strike, Dribble and Roll should be taken into consideration.

Table 3. Comparison of Mastery Performance between Children with MLD & TGMD-2 Norm Population

Locomotor Test Items	% of mastery			Object-Control Test Items	% of mastery		
	MLD	TGMD-2	<i>p</i>		MLD	TGMD-2	<i>p</i>
Gallop	20.00	45.00	.006	Strike	0.00	53.00	.000
Hop P	0.00	48.00	.000	Dribble	21.43	28.00	.000
Hop NP	0.00	48.00	.000	Roll	14.29	60.00	.040
Leap	0.00	52.00	.000				
Jump	6.67	56.00	.002				
Slide	53.33	19.00	.014				

Conclusion

Gross motor skills play an important role in developing the child holistically. Children with typical development would attain an acceptable level of motor proficiency by the age of nine years to participate in physical play. Overall, studies have shown that children with disabilities tend to have poorer motor skills as compared with children with typical development (Revie & Larkin, 1993; Simons et al., 2008). The findings of this study indicated that children with MLD were lagging behind their age-matched peers by approximately four years in terms of TGMD-2 test items. The skill mastery of children with MLD was significantly poorer for eight out of 12 TGMD-2 test items especially locomotor skills. The authors recommend a motor intervention programme which includes a deliberate plan to improve the skills of Gallop, Hop, Leap, Jump, Slide, Strike, Dribble and Roll.

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