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The Relationship Between Childhood Traumatic Experiences and Gang-Involved Delinquent Behavior in Adolescent Boys

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Abstract

The extent to which both traumatic life experiences and resiliency factors contributed to gang-involved delinquent behavior in adolescent males was investigated. Results indicated that the juvenile delinquent residential treatment setting participants had significantly higher levels of both Posttraumatic Stress Disorder (PTSD) symptomatology and emotional numbing than regular education high school students. Results also revealed that emotional numbing in the residential treatment setting participants positively correlated with gang-involved delinquent behavior. In addition, the low resiliency scores of residential treatment setting participants positively correlated with both gang involvement and delinquency. Practical implications of this study were discussed, including the effectiveness of screening for PTSD symptomatology when considering admission to a residential treatment facility and creating treatment goals.

The Relationship Between Childhood Traumatic Experiences and Gang-Involved Delinquent Behavior in Adolescent Boys

Gang - involved delinquent behavior is a concern that has a far reaching impact in school and communities (Black & Krishnakumar, 1998; Fest, 1999; Maldonado - Dura'n & Millhuff, 2002; Smith & Thornberry, 1995). This behavior poses a threat to society, and professionals struggle to address this problem so that children and families are not continually impacted.

Experts that work with gang-involved and delinquent adolescents state that many youth have experienced traumatic life events to such an extent that their either suffer from PTSD symptomatology or have become desensitized to violence (Astor, 1998; Battin - Pearson, et al., 1998; Crimmins, et al., 2000; Esbesen, 2000). When reviewing traumatic experiences and their impact, Freud (1920) believed that each individual possessed a type of psychological shield that protected him from harmful stimuli. If this shield were breached, the individual would feel helpless and traumatized, and this traumatic/helpless feeling would be experienced over and over until the individual was able to create an appropriate defense mechanism to deal with the emotion (i.e. violence, aggressive behavior, and/or delinquent behavior). Freud also believed assisting an individual to create a healthy defense mechanism was the best treatment for any type of posttraumatic reaction (Freud, 1920; Freud, 1939).

In relation to experiencing trauma, Horowitz and Solomon (1978) explained that individuals will create an emotional denial/ numbing tendency to protect themselves from having to reexperience the hurtful and disturbing emotions and ideas they have suffered from traumatic experiences. They elaborated that

this tendency is so powerful, that it is able to alienate and isolate the traumatic experience for the person so that they do not have to assimilate too quickly to their current environment and that they may be able to participate in a functional way in their everyday life. Horowitz and Solomon's (1978) research looks at PTSD and Vietnam War veterans. Their research demonstrated that when the veterans had to integrate their life traumatic experiences from the war into their former lives, they experienced numerous psychological problems, such as, low self - worth, shame, depersonalization, frustration, and reactive rages, and various psychosocial disabilities (Johnson, 1998). Similar to other researchers, it was concluded that the behavioral difficulties experienced by the Veterans resulted from their life traumatic experiences in the war Horowitz & Solomon, 1978; Johnson, 1998; Trimble, 1981; Van der Kolk, 1996).

In the context of this study, it is important to state that children can and have experienced extreme traumatic life events (Anthony & Cohler, 1987; Conner, 2002; Ebensen et al., 1993; Garbarino, 1997; Johnson, 1998; Maldonado-Dura'n & Milhuff, 2002; NIMH, 2002; Smith & Thornberry, 1995). Theoretical knowledge of posttraumatic reactions support maladaptive behavior as a result (Bilchik, 1999; Carrion & Steiner, 2000; Ebensen et al., 1993; Flannery, 1998; Loeber & Stouthamer-Loeber, 1998; NIMH, 2002; Smith & Thornberry, 1995; Thornberry & Burch, 1997). Although, there is extensive research focused on PTSD symptomatology in adult population and war survivors, society has been seeing an increase in youth that have experienced traumatic life events expressing similar maladaptive behaviors (Hawkins et al., 2000; Mussen & Kessen, 1983; Sullivan & Wilson, 1995; Thornberry & Krohn, 2000; Wilson & Kean, 1997).

Just as research detailed potential detrimental consequences resulting from experiencing traumatic life events, there are also experts that have identified children that have been exposed to traumatic life events and do not become participants in gangs or delinquent behavior. These children are deemed resilient and applauded for their ability to persevere and succeed in the face of difficult life circumstances (Anthoy & Cohler, 1987; Garbarino, 1997; Reynold & Kamphaus, 1998). In identifying the development of resiliency, Wolin (2003) reports resiliency factors develop in the presence of nurturing and protective environments (i.e., schools, communities, and families). She indicated that for children who do not have such environments accessible to them, support offered through special services; including therapy, can function as surrogate protective environments (Wolin, 2003). Factors such as personality characteristics, personal attributes, environmental characteristics, caring parenting behaviors and family cohesiveness, school/home relations, caring, mentoring by teachers, provision of opportunities to learn in school, and involvement in community activities and sports are commonly tied to resiliency (Carver, 1998; Wolin, 2003; Widom, 2003). Black and Krishnakumar (1998) support the claim that parents who provide encouragement and reassurance during adversity help restore a sense of safety and trust for the child. Parents that assist their children with understanding and processing traumatic life events provide them with the appropriate resiliency tools to recover from a traumatic experience successfully (Garbarino et al., 1992).

The ability to accurately predict those children who are more likely to engage in gang-involved delinquent behavior can contribute to the reduction of violence in schools and communities, as it will also aid in the development of more effective, proactive methods of intervention. Traditionally, treatment of youth participating in gang-involved delinquent behavior has not included the addressing of traumatic life events, although more recent literature provides some evidence to the contrary (Alat, 2002; Hawkins et al, 2000; Maldonado - Dura'n & Millhuff, 2002; OJJ, 2001). In addition, investigation into the development and acquiring of resiliency skills is beginning to play more of a role in treatment options for gang - involved delinquent youth in residential treatment settings (Brendtro & Shahbazian, 2003).

The objective of the present study was to evaluate the extent to which both traumatic life experiences and resiliency factors contribute to gang - involved delinquent behavior in adolescent males. The Trauma Symptom Checklist for Children (TSCC) evaluated clinical levels PTSD symptomatology and emotional numbing while the Behavior Assessment Symptom Checklist (BASC), based on four subscales, provided scores evaluating resiliency factors. Gang - involved delinquent behaviors were assessed through combined scores earned on the Denver Youth Survey (DYS) (gang involvement) and the Self Report Delinquency Scale (SRD) (delinquent behavior). Statistical analyses were performed in an attempt to validate and determine the influence of the PTSD symptomatology and resiliency factors on gang - involved delinquent behavior of adolescent males.

Method

Participants

Participants for this study were composed of the adolescent male high school students with no juvenile delinquent history and adolescent males in a residential treatment setting that had a pending PINS petition or JD charge. The participants were all from the Nassau County area in New York. There were 65 participants in each group and they were all between the ages of 14 and 17.

Results

On the PTSD symptomatology scale, the residential treatment setting participants had mean scores higher than the typical high school students. An independent samples *t* - test demonstrated that the residential treatment setting group participants earned significantly higher scores on the PTSD symptomatology subscale ($t = 2.88, p < .01$). The residential treatment setting participants also earned higher mean scores on the scale evaluating Emotional Numbing. An independent samples *t* - test revealed Emotional Numbing was also significantly higher in the residential treatment group ($t = 1.99, p = .04$). Therefore, results supported that residential treatment setting participants had significantly higher levels than the comparison group of both PTSD and Emotional Numbing.

Emotional Numbing, Delinquency and Gang Involvement scales were compared using a correlation matrix. Results indicated that Emotional Numbing was significantly correlated with both Gang Involvement ($r = .47, p < .01$) and Delinquency ($r = .25, p = .03$). These results indicated that Emotional Numbing positively correlated with gang - involved delinquent behavior.

Resiliency was composed of four factors on the BASC, which included the participants' relationship with their parent, their interpersonal relationships, self - esteem and self reliance. While controlling for PTSD, MANOVA results indicated that the residential treatment participants' interpersonal relations $F(1,138) = 5.64, p = .01$ and self reliance $F(1,138) = 6.55, p = .01$ scores were significantly lower than those resiliency variables in the typical high school students and both accounted for 4 % of the variance respectively. However, the resiliency variables of relationship with parent $F(1,138) = 1.92, p = .16$ and self - esteem $F(1, 138) = 2.96, p = .08$ were not significantly lower. Therefore 2 of the 4 resiliency variables were determined to be significant lower in the residential treatment participants than in the typical high school students. In addition, MANOVA results demonstrated that both Gang Involvement $F(1,138) = 5.13, p = .02$ and Delinquency $F(1,138) = 4.03, p = .04$ were significantly higher than the residential treatment setting participants, accounting for 2 and 4% of the variance respectively,

supporting that the residential treatment participants had higher levels of gang - involved delinquent behavior.

A one - way ANOVA revealed that the residential treatment setting participants reported significantly lower interpersonal relationship scores $F(1, 138) = 4.80, p = .03$ and significantly lower self - reliance scores $F(1, 138) = 6.77, p = .01$, supporting that 2 of the 4 resiliency factors were significantly lower than that of the typical high school students. MANOVA results also supported that the Resiliency scores significantly correlated with both Gang Involvement $F(1,138) = 5.13, p = .02$ and Delinquency $F(1, 138) = 4.03, p = .04$.

Discussion

The current study sought to examine traumatic life events and resiliency skills in an effort to determine the extent of their relationship in the prediction of gang-involved delinquent behavior and PTSD symptomatology in adolescent males in a residential treatment setting and in a typical high school setting.

PTSD Symptomatology and Emotional Numbing

The results supported that the residential treatment setting participants had significantly higher levels of PTSD symptomatology and emotional numbing when compared to typical high school students. Participants that enter the residential treatment program, often arrive through court order with juvenile delinquent charges or under Person in Need of Supervision (PINS) petition status. Often during the first thirty days (the diagnostic period) of their stay, residents discuss their life history, which often seems to include many difficult and challenging life experiences. The impact of these experiences seems to be compounded by the fact that the residents often come from dysfunctional family systems that may include, but are not limited to, parents with mental disorders, histories of parental drug and alcohol abuse, physical abuse as victim and/or perpetrator, sexual abuse as victim and/or perpetrator, and not having parents at all. Often these residents have a history of running away from home, school truancy, and poor grades. Therefore it was quite probable that the exposure to and magnitude of traumatic events in these residential treatment participants resulted in PTSD symptomatology. Paradoxically, however, it was also probable that repeated exposure to these events resulted in desensitization to violence, so much so that it was often considered normal in the experience of the residential treatment participants. Further, although many of the residential treatment participants endorsed responses consistent with the PTSD symptomatology, very few actually earned scores in the clinically significant range. However, that will be discussed in more detail later. The typical high school students also endorsed responses that reflected some level of PTSD symptomatology, but their responses were significantly lower than those of the residential treatment setting participants. The assumption is that every individual has been exposed to some traumatic or distressing life event. Each of those events may have had the potential to develop into a more serious clinical issue such as PTSD but the typical high school student is believed to have less exposure to traumatic life experiences overall.

The TSCC subscale that evaluated PTSD symptomatology, asked questions directly from the criteria of PTSD as identified by the DSM – IV - TR. Although many individuals report PTSD symptomatology after experiencing a traumatic life event, those symptoms are not classified as PTSD until the same symptoms are experienced with similar intensity consistently for at least one month after the event. It appears that the difference between the participants in residential treatment and the typical high school student is what may happen to them or what level of support they are given in that time immediately

following the traumatic event. However, even if the symptoms do not persist, it is still important to be aware and be able to monitor the symptomatology to ensure that the symptoms do not develop into a more problematic issue.

Emotional numbing or desensitization was also examined in hypothesis one as it is reported be a contributing factor to gang - involved delinquent behavior. The emotional numbing score of the typical high school students was significantly lower than that of the residential treatment setting participants, indicating that typical high school students are not as desensitized to violence and the consequences of violating societal norms as the residential treatment setting participants. In addition, the emotional numbing scale also evaluated feelings of depersonalization and avoidance. This score was significantly higher in the residential treatment setting participants. Seligman and Garber (1980) explain the presence of emotional numbing through the development of learned helplessness. They reported that externalized attribution of control is learned from the exposure to many violent and traumatic experiences and the learned helplessness response results in motivational deficits when the victim of traumatic experiences ceases to initiate adaptive responses. Many of the study participants were placed in treatment because they have broken the law numerous times and the residential treatment facility is the last chance the participant has to learn to make better life decisions before they are sent to a penitentiary. The elevated emotional numbing score in this group suggested that they have become so desensitized to violence and/or traumatic situations that it has impaired their judgment, which may indeed be the reason they are placed in residential treatment.

The lower emotional numbing score in the typical high school students may be attributed to the fact that the typical high school student does not have that same level of exposure (whether it be in number of times or magnitude) to violent traumatic events as does the population that exists in the residential treatment setting. In addition, a typical high school student, in this study, had no formal history of delinquency or PINS status. Therefore, it is probable that when exposed to a traumatic events or gang-involved delinquent behavior, the event or behavior is still shocking and viewed as inappropriate. Many of the residential treatment setting participants provided situation specific reasons why gang-involved delinquent behavior was appropriate. In addition, when these participants discussed violence in their family or among their peer groups, it was stated as a common occurrence often explained in an unemotional manner, not as necessarily an exception to their daily routine. The typical high school students, although aware of gang-involved delinquent behavior and traumatic experiences involving violence, had a difficult time thinking of personal examples, but often referred to movies or television shows when providing examples.

Emotional Numbing and Gang-Involved Delinquent Behavior

The data reflected that the residential treatment setting participants' emotional numbing score positively correlated with both gang involvement and delinquent behavior. When discussing gang - involved delinquent behavior with the residential treatment setting participants, many spoke of their behaviors with levity. When asked if it was worth the consequences or if asked about how the victims of the crime may have felt, they seemed to struggle with empathy and understanding the impact of their behavior on someone else. They often attempted to justify their behavior or explain it as "the person should have known better than to come to my neighborhood", the victim "should not have had so much money on them", or "they should not have said that to me". The aforementioned attitude seemed to be common among the residential treatment participants and is consistent with not only being desensitized to violence, but also with poor problem solving and social skills and inadequate frustration tolerance. The attribution of the inappropriate behavior was more often external for the residential treatment participants and they very rarely took responsibility for their own behavior. When responsibility was taken, it was only by those individuals that had been in placement for longer than six months, and even

then they still explained that they did not necessarily feel guilty about the actual incident, but were definitely sorry that they were caught. They talked of being in the moment and thinking more about the immediate gratification results, not of the consequences of being caught. When discussing their gang-involved delinquent behavior, some of the residential treatment setting participants said that in the moment, they were aware of what they were doing, but felt they were watching someone else perform the act. One participant described his involvement when participating in a drive-by shooting. He explained that everything seemed to be happening in slow motion. He stated he was so angry at them (the other gang), although in retrospect he could not remember why. He stated that when he pulled the trigger, he did not care about who or what he shot as long as he hit someone. He reported that everything seemed to be happening as if he was watching himself in a movie. He stated, "... it was kind of cool".

On the DYS, gang involvement is ascertained initially by directly asking the question if the participant is currently or has ever been involved in a gang, and then depending on the response, the level of gang involvement is determined through a variety of questions that examine the illegal activities of the gang. Gang involvement is strictly prohibited at the residential treatment setting. Participants were very hesitant to admit involvement in a gang for fear of further penalty against them when the information was disclosed to their respective treatment team. A condition to have the residents participate in this study was to have the information available to the participant's treatment team upon request. For residential treatment participants that had been in the facility for over six months, if they even admitted to gang involvement, they made it very clear it was a part of their past and they had no intention of pursuing it upon release from the residential treatment setting. The residents that were new to the facility were more likely to admit current gang involvement and often bragged about their activities.

The SRD scale evaluated delinquent behavior in terms of general, minor, moderate, serious, and violent delinquency. Many of the questions that evaluated serious and violent delinquency were similar to the items of the DYS that evaluated level of gang-involvement. When reviewing the data, this score overlap assisted in validating the responses of the residents and for the residents that denied gang involvement, it either validated or disproved their claim. Some residential treatment participants claimed that although their friends were in gangs and they spent time with them participating in the same activities, they were not a part of the gang or gang involved.

Resiliency and Gang-involved Delinquent Behavior Excluding PTSD

Results reflected that even when excluding the presence of PTSD symptomatology the residential treatment setting participants still reported lower levels of resiliency skills and higher levels of gang-involved delinquent behavior. This finding was especially important, because it demonstrated that even if PTSD symptomatology is not a factor; the participants in the residential setting still had fewer resiliency skills and more participation in gang-involved delinquent behavior. Resiliency is often discussed in literature as the factor that gives individuals the strength to persevere in the midst of difficult circumstances. Although it is a fairly broad concept, it is commonly viewed as the ability to "bounce back" after a difficult experience. Resiliency is composed on many factors and it is believed that youth who are consistently exposed to adverse circumstances and adopt inappropriate behaviors to cope with their feelings or as an expression of their feelings, lack resiliency, by definition. It is not surprising that the participants in residential treatment have lower resiliency scores than the typical high school students. The fact that they have been placed in that a residential treatment facility speaks to their inability to make appropriate choices. The data that demonstrates that the residential treatment setting participants have higher levels of gang-involved delinquent behavior than the typical high school students was also expected, given the nature of offenses for which the participants are placed, but also slightly surprising given the strict policy about gang involvement that exists in the facility.

Resiliency was measured through the adaptive behaviors subscales on the BASC. Specifically, self-esteem, self-reliance, interpersonal relationships, and relationships with parents were the factors that were assessed and then evaluated to determine resiliency. In this current study, the factors of self-reliance and interpersonal relationships were the only resiliency variables that were significantly lower in the residential treatment group. Self-reliance was defined by the BASC as a belief in one's self and a belief in one's ability to accomplish a task or achieve a goal. Interpersonal relationships variables identified the participant's ability to forge positive connections with others, communication of wants, desires, and needs appropriately and the ability to resolve conflicts. The lack of these resiliency skills correlated with the participation in gang-involved delinquent behavior. Research about youth that become gang involved and participate in gang-involved delinquent behavior discuss the absence of the ability to make good social decisions (Fest, 1999). Many of the participants from this residential treatment setting attributed their participation in the gang to peer pressure. Some even acknowledged their inability to make good decisions and admitted they are easily influenced by their friends.

The other two resiliency variables were not significantly lower in the residential treatment setting participants. It appeared that in their relationship with their parents and in their self-esteem, residential treatment setting participants did not differ significantly from the typical high school students. Adolescence is a time when the peer group has a significant contribution to decision making in teenagers. Social learning theory supports this finding as it states that the likelihood that a given behavior will occur in a specific situation is a function of an individual's expectancies concerning the outcomes the behavior will produce and the reinforcement value attached to such outcomes (Rotter, 1982). In adolescence, the peer group acceptance provides the reinforcement to encourage or discourage behaviors, and adolescents make decisions about their behaviors often based on how they think it will be received by their peers. In most cases, the parental contribution has been made in value setting, establishing limits and expectations, and overall creation of moral and belief systems. Psychodynamic theory supports that if the parent has not been involved by the time the child enters adolescence, the child has already formed their inherent ideas about right and wrong and is not easily swayed by a new parental directive. If the parents have been involved in a child's life and have explained and taught the child their belief and values system in adolescence, these core beliefs should not deviate far from what has been instilled earlier in life. Although there are always exceptions, it is not surprising that there is not a significant difference in the parent relationship variable between the residential treatment setting participants and the typical high school students. However, it is also possible that parent relationship has absolutely no contribution to resiliency which would also explain the lack of significant difference. It is quite possible resiliency is composed of many more innate factors that are not influenced by the relationship or lack of the relationship with the parent.

In addition, self-esteem did not differ significantly between the groups. Developmentally, adolescence is a time when children globally experience insecurities and areas of confidence when transitioning through high school. Although, it is plausible that having confidence in self would significantly contribute to the ability to make decisions about participating in gang-involved delinquent behavior, there are many unknown variables that contribute to self-esteem that may or may not impact decisions to become a participant in gang-involved delinquent behavior. It is also possible that self-esteem did not differ significantly in groups because regardless of the experience, this group of teenagers was just more alike than different in their feelings about themselves.

Gang-Involved Delinquent Behavior and Resiliency Skills

Results further indicated that the residential treatment setting participants reported significantly lower resiliency scores than the typical high school students. In addition, data revealed that the low resiliency scores of the residential treatment setting participants positively correlated with gang involvement and

delinquent behavior. This finding is consistent with other data results in that it appears that with the presence or absence of PTSD symptomatology, residential treatment setting participants still display significantly lower interpersonal relationship skills and self-reliance skills than do the typical high school student group. The residential treatment setting participant's low resiliency scores positively correlated with gang-involved delinquent behavior. This finding is also consistent with the Ruchkin study (2002) which supported that traumatic exposure can influence aggressive and delinquent behavior independent of actual PTSD. Also, as in previous results, between the participant groups there was an unremarkable difference in the areas of self-esteem and relationship with parent. It is important to note that all participants reported that they experienced a significant traumatic event in their life before participating in any gang involvement or delinquent activity.

Practical Implications

Findings from this study have confirmed that identification of PTSD symptomatology can be useful in the prediction of gang involvement and delinquent behavior for adolescent males within the residential treatment setting. Results from the current study indicate the importance of including a measure to evaluate the presence of PTSD symptomatology. Based on the current findings early and accurate identification of PTSD symptomatology can serve to predict those residents who are more likely to become involved in gangs and delinquent behavior in the future.

This information can also be helpful in placement meetings when developing treatment goals for residents. In addition, it seems that treatment goals should address the presence of PTSD symptomatology as appropriate. Also, findings assist in amplifying the importance of implementing the teaching of resiliency skills into the daily living routine for youth in residential treatment settings. Teaching resiliency skills serves to prepare adolescents that are temporarily removed from society with those abilities that will enable them to better cope with any traumatic or stressful life experience they may encounter after leaving the residential treatment facility setting.

If treatment goals and clinical strategies are established based on presence of PTSD and the development of resiliency skills, it may modify the strategy used in helping the resident and also provide the resident with skills they can use over a period of time as opposed to temporarily stabilizing the inappropriate behavior for which they were admitted. This ultimately should decrease the rate of recidivism for the same offense, and give the resident beneficial skills to better cope with problems or difficult feelings.

Summary

In conclusion, the present study addressed the issues relating to the prediction of gang-involved delinquent behavior in adolescent boys. PTSD symptomatology and emotional numbing, resulting from traumatic events, were determined to be significantly higher in residential treatment setting participants. Residential treatment setting participants also reported significantly lower scores in two identified resiliency factors. Future research may provide a more complete understanding of the factors which contribute to the prediction of gang-involved delinquent behavior among adolescent males, how resiliency can mediate this impact, and the extent to which traumatic life events influence these behaviors.

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What Do Brothers and Sisters Think? An Investigation of Expectations of Siblings with Autism Spectrum Disorders

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Abstract

This study, with its foundation in expectancy theory, investigated the expectations of siblings of children with autism spectrum disorders (ASD). Forty siblings, 7-22 years of age, in Texas completed a 19-item survey that examined the expectations of siblings of persons with ASD according to the sex and age characteristics of these sibling dyads. The results indicate that there is an association between the expectations of siblings of persons with ASD and the respective sex and age characteristics of these sibling dyads. Siblings of same-sex dyads appeared to have significantly higher expectations for their sibling with autism while siblings of different-sex dyads appeared to have significantly lower expectations for their sibling with autism. Results also indicate a significant association between sibling dyad age differences and expectations.

Once rare disorders, the diagnosis of an autism spectrum disorder (ASD) is more prevalent today than ever before. In the year 2000, the American Psychiatric Association estimated that the prevalence rate of ASDs was approximately 1 person in 2,000 (APA, 2000). Current statistics from the Center for Disease Control's Autism and Developmental Disabilities Monitoring Network estimates that ASDs are found in 1 in 150 children across the United States (CDC, 2007). ASDs transcend all ethnic and socioeconomic groups, though affecting more boys than girls. Due to these increasing numbers of families confronting issues associated with raising a child with an ASD, there is an increasing number of typically-developing siblings who are affected by ASDs.

Autism is a pervasive developmental disorder that has a major impact on the family unit (Kaminsky & Dewey, 2002). Research indicates that having a child with a disability in the family leads to difficult role changes and adjustments for the family, specifically for siblings (Cuskelly, Chant, Hayes, 1998). Research has heightened the concern for the adjustment and coping abilities of sibling of children with autism (Hastings, 2003). In considering sibling-adjustment, siblings of individuals with autism tend to view their relationship with their sibling with autism in a positive light when they are not worried about their sibling's future (Kaminsky & Dewey, 2001). Therefore, an examination of the expectations of siblings for their brother or sister with ASD in the future becomes an important indicator of sibling-adjustment.

Expectancy theory provides one conceptual approach to understanding the influence of sibling expectations, such that understanding how a person's expectations will hence produce specific

outcomes as a combined function of the values a person endorses on those outcomes (e.g. Expectancy x Value = Behavior; Bandura, 1995). From this conceptual approach, the behavior of individuals is often based on their expectancy beliefs about the probable outcomes of a particular behavior and the value of said particular behavior. Outcome expectancies can be viewed as a form of cognitive motivators for humans. Thus, the expectations for siblings of individuals with autism would appear to influence the behavior on the part of these siblings toward their siblings with autism.

As such, research has indicated that siblings play an essential role in the cognitive, affective, and social development of a child (Verte, Roeyers, & Buysse, 2003). Kaminsky and Dewey (2001) have suggested that siblings of children with autism are impacted socially and emotionally by their sibling and create both positive and negative perceptions of their sibling over time. In reviewing the literature, the results of various studies have shown that siblings of children with autism report less intimacy and nurturance from their sibling when compared to siblings of individuals with Down syndrome (Kaminsky & Dewey, 2001; Pilowsky, Yirmiya, Doppelt, Gross-Tsur, & Shalev, 2004). It is suggested that siblings of children with autism are reporting less intimacy, nurturance, and social insufficiency as a result of the traits that may be considered typically associated with autism (Kaminsky & Dewey, 2001).

Additionally, being raised with a sibling with a disability in general is predicted to have an influence on the social and emotional adjustment on members of the family (Pilowsky et al., 2004). Relatively few studies have investigated the impact of psychosocial adjustment of siblings with children with autism; however, some research has indicated that a child in a family with a sibling with a disability has increased risks for externalizing and internalizing behaviors (Kaminsky & Dewey, 2002; Fisman, Wolf, Ellison, Gillis, Freeman, & Szatmari, 1996). Further, siblings of children with autism have a heightened risk of developing poor psychological adjustment such as depression, loneliness, and behavior problems (Hastings, 2003; Pilowsky et al., 2004). Some studies suggest that poor psychological adjustment in siblings could be due to feelings of resentment, perceived loss of attention, or increased parental stress (Harris & Glasberg, 2003; Pilowsky et al., 2004).

The purpose of the current study was to examine the expectations of siblings of persons with autism according to the sex and age characteristics of these sibling dyads. To achieve this purpose, three research questions were examined. The first research question concerned sibling dyads where one sibling has autism, whether these siblings without autism have significantly different expectations for their sibling with autism according to the sex characteristics of these dyads (e.g. same- or different-sex dyad)? The second research question considered the relationship between sibling dyad age difference and these expectations. Our third and final research question examined whether after controlling for the ages of the individual with autism and their sibling, do same- or different-sex dyad differences in expectations (if any) persist.

Method

Participants

The current study consisted of 40 siblings of individuals diagnosed with an autism spectrum disorder (ASD) whose parents attended autism support groups in the state of Texas. Approximately 46.3% (n = 19) of the sample were same-sex sibling dyads, where both the sibling with autism and without autism were of the same sex (e.g. brother-brother or sister-sister). The remaining 53.7% (n = 22) of the sample

consisted of different-sex sibling dyads, where one sibling was male and the other sibling was female (e.g. brother-sister or sister-brother). The average age of the persons with autism was 9.58 years old (SD = 4.11) while the average age of their sibling was 12.95 years old (SD = 6.24). Four of the sibling-respondents were female (10%). Approximately 36 % (n = 14) of the siblings with autism were classified with mild while 36% (n = 14) with moderate diagnoses. Eighteen percent (n = 7) of the siblings were diagnosed with severe ASD while approximately 10% (n = 4) were diagnosed with Asperger's syndrome. There were no siblings diagnosed with Rhett's Syndrome.

Measure

A parental expectation survey, adapted from Ivey (2004), was utilized to investigate expectations according to siblings of individuals with an ASD. Siblings, rather than parents, were asked to rate expectations for their brother or sister to achieve a particular future outcome specified by each item. The 19-item scale consisted of a 5-point Likert-type response format with values ranging from strongly disagree (e.g. a value of 1) to strongly agree (e.g. a value of 5). The items on the instrument for the current study consisted of 19 items. In examining the internal consistency of scores, the data obtained achieved a Cronbach's alpha value of $\alpha = .88$. Table 1 contains a complete description of each of the nineteen items adapted.

Table 1

Means and Standard Deviations of Siblings Expectation

Statement: My sibling with autism will...	All ages		Age 7-12		Age 13+	
	Mean	SD	Mean	SD	Mean	SD
1. be happy in life.	3.88	.86	3.90	.83	4.00	.93
2. attend school.	4.50	.86	4.52	.67	4.52	1.06
3. grow up and get married.	3.14	1.03	3.14	1.01	3.11	1.11
4. own a house.	3.00	1.19	2.76	1.22	3.23	1.09
5. have the help of friends.	4.00	1.04	4.09	.99	3.94	1.14
6. belong to a church.	3.26	1.15	3.33	1.23	3.23	1.14
7. be accepted by others.	3.52	1.09	3.33	.96	3.82	1.23
8. have enough money in life.	3.57	.94	3.42	.92	3.76	.90
9. be safe from harm.	3.74	1.25	3.38	1.24	4.17	1.13
10. have the most education possible.	4.24	.93	4.38	.86	4.17	1.13
11. help with household chores.	3.50	1.27	3.57	1.28	3.58	1.22

12. obey the law.	4.12	1.06	3.90	1.09	4.29	1.10
13. help take care of parents in old age.	3.10	1.38	3.09	1.30	3.05	1.56
14. live by his or her self.	2.50	1.17	2.09	1.30	3.00	.79
15. have time to play.	4.38	.70	4.28	.71	4.47	.71
16. hold a job.	3.52	1.11	3.47	1.20	3.64	1.05
17. have his/her own children.	2.88	1.15	3.04	1.32	2.64	1.05
18. get help from those around us.	4.10	.98	4.04	1.07	4.23	.90
19. be successful in school.	4.24	.80	4.23	.76	4.31	.87
Total	3.66	.60	3.55	.62	3.80	.54

Procedure

Participants were contacted via ASD parent support group meetings attended by the researcher during the summer months of 2007. The parents as well as the participants signed the consent forms when participants were under the age of eighteen. All analyses were performed in SPSS (v. 16.0). Approximately 4.7% ($n = 2$) of the cases had missing values thus values for missing data were handled using a listwise procedure.

Analysis

To answer the first research question, we performed an independent samples t-test to determine whether the expectations of siblings of persons with autism differed according to sibling sex dyad being either same- or different-sex. In testing for the assumption of the homogeneity of variances, our Levene's test indicates that this assumption was retained, $F(38) = 1.574$, $p = .22$. In examining our second research question, we calculated a Pearson's r as a measure of correlation between sibling dyad age difference and expectations. To examine our third and final research question, we performed an analysis of covariance where we controlled for ages of the individual with autism and of their sibling. In testing the assumption of the homogeneity of slopes, our results indicate that this assumption was retained, $F(2, 36) = 1.544$, $p = .23$. Values for Cohen's d were calculated as the measure of effect size. A Cohen's d value of .20, .50, and .80 or larger may be considered as small, medium, and large respectively (Cohen, 1988).

Results

In examining our first research question, same-sex sibling dyads (e.g. brother-brother or sister-sister) had significantly different expectations than different-sex sibling dyads, $t(38) = 2.093$, $p < .05$, $d = .67$. Same-sex siblings of persons with autism had significantly higher expectations ($M = 73.11$, $SD = 8.82$)

than different-sex siblings of persons with autism ($M = 65.90$, $SD = 12.43$). Our value of Cohen's d additionally indicates a medium to large association between sibling sex dyad and expectations for a sibling with autism.

For our second research question, results indicate that sibling dyad age differences were significantly related to sibling expectations, $r = .38$, $p < .05$. This value of Pearson's r may be viewed as small to moderate. As the absolute age difference among siblings increase, it appears that the higher the expectations of the sibling become. Given that the majority of the sample consisted of siblings older than the person with autism (75%, $n = 30$), we were not able to examine the directionality of this relationship.

To answer our third and final research question, our results indicate that differences in expectations according to sibling sex dyad (e.g. same- or different-sex) did not persist as statistically significant after controlling for the ages of the individual with autism and their sibling, $F(1, 36) = 3.27$, $p = .08$. This result suggests that among different-sex dyads, siblings without autism may have significantly lower expectations for their sibling with autism but that this may be a function of sibling dyad age differences.

Discussion

The results of the current study indicate that an association between the expectations of siblings of persons with autism and the respective sex and age characteristics of these sibling dyads. Siblings of same-sex dyads appeared to have significantly higher expectations for their sibling with autism while siblings of different-sex dyads appeared to have significantly lower expectations for their sibling with autism. However, our results also indicate a significant association between sibling dyad age differences and expectations, thus we decided to statistically control for the age of the person with autism and their sibling and re-examine differences in expectations according to whether the sibling was of the same or different sex. Our results suggest that after controlling for this variable of age, that differences in expectations do not persist across same- or different-sex dyads.

Research has shown that sex composition for siblings directly affects the sibling relationship. For example, Orsmond and Seltzer (2007) indicate that when siblings are the same sex-dyad, the relationship is perceived as more positive than when siblings are of different sexes. Additionally, when there are different-sex sibling dyads present within the family, these relationships are generally considered less intimate. More interestingly, according to a recent longitudinal study, Kim, McHale, Osgood, and Crouter (2006) found that levels of intimacy among same-sex sibling dyads did not change significantly across time. However, mixed-sex or different-sex sibling dyads are reported as having less positive relations from middle childhood through early adolescence, but these relationships are then perceived as more positive in middle adolescence. The influence of age in sibling dyads regardless of sex composition appears to be overarching. After controlling for age in our analyses, differences in expectations among siblings of individuals with autism according to sex composition of the sibling dyad disappeared.

While age has been shown to have no effect on coping skills of typical-developing siblings of children with ASD (Rivers & Stoneman, 2003), the expectations of siblings of children with ASD appear to be function of age and perhaps dependent on their understanding of ASD. In general, developmental disabilities may be considered more abstract than physical disabilities and therefore more difficult to understand. According to Glasberg (2000), siblings' understanding of autism increased with age with a

demonstrated understanding beginning at approximately seven years of age. While Timmons (2008) has noted that siblings of individuals with autism may worry about the future of their sibling with ASD and resent the potential responsibility for helping with that sibling, the results of our study indicate that expectations of siblings with autism generally become positive over time.

In conclusion, our results support previous research indicating that sex composition does influence how siblings view their relationships. However, when controlling for the variable of age differences in the dyads, the differences in expectations of siblings of individuals with autism disappear. For parents and practitioners, we suggest that sibling relationships in families with individuals with autism be viewed in light of these findings on key two points. First, it should be acknowledged that males and females interact differently with another and second, that these interactional differences are a function of age. These findings should provide consolation to parents and practitioners trying to help families manage and adjust to living with a child with autism. In view of expectancy theory, future research should continue to examine the expectations of siblings of autism with further attention dedicated to these relationships as they progress across time.

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Investigating Secondary Special Educator's Perception of Interagency Collaboration

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Abstract

This paper addresses the development and validation of the Interagency Collaboration Scale (ICS), a 17-item self-report measure that investigates secondary special educators' perceptions of interagency collaboration. An exploratory factor analysis was conducted on data from a sample (N = 260) of secondary special educators who are members of the Council for Exceptional Children. The results revealed a 4-factor solution as the most interpretable factor pattern. These four factors were: Importance of Interdisciplinary Collaboration, Collective Ownership of Goals, Newly Created Professional Activities, and Evaluation on Collaborative Process. The reliability estimates were acceptable from .76 to .83. The factor structure was recovered in a confirmatory factor analysis conducted on a second, independent sample (N = 343). Limitations and Implication were discussed.

Investigating Secondary Special Educator's Perception of Interagency Collaboration

During the past two decades, the field of special education has adopted the term "transition" to specifically facilitate students with disabilities a successful life change into adult world. The transition outcomes defined and mandated under the Individuals with Disabilities Act (IDEA) of 1990 and the authorizations in following years include community and independent living, further education, employment and instruction, and mandatory linkages with vocational rehabilitation and other adult service agencies. The ultimate goal of transition services is to insure successful community integration for students with disabilities. The community integration philosophy incorporates such concepts as civil liberty, least restrictive environment, right to treatment and to refuse treatment, quality of life, engaging natural helpers, and coordination among the system of services (Greene & Kochhar-Bryant, 2003, p. 52).

To allow the successful postsecondary outcomes to become a reality, secondary special educators play an influential role in this transition process (Benz, 1995; Benz, Lindstrom, & Yovanoff, 2000; Wandry, Pruitt, Fox & Anderson, 1998). However, a special educator alone cannot accomplish the requisite desired transition outcomes for students with disabilities without collaborating with others (Eber,

Nelson, & Millers, 1997). Therefore, interagency collaborations have been formed to provide outreach and support to students with disabilities. Many partnerships exist modeling interagency collaboration between schools and local private and non-profit social services agencies (Lawson & Barkdull, 2001; Tourse & Sulick, 1999).

Since the 1980s, there has been a remarkable increase in collaboration among human service agencies, government, and community organizations (Abramson & Rosenthal, 1995; Mattessich & Monsey, 1992). A major impetus for collaboration in the modern time is from the supporters of service integration for children and families (Anderson-Butcher & Ashton, 2004; Bronstein, 2002). Service integration derives from the need of systematic efforts to solve problems of service fragmentation and fracture, in which services are usually developed and delivered in a disjointed and uneven way.

However, current practices and policies, including differences between youth and adult service delivery systems and the lack of interagency collaboration, complicate service coordination. As students with disabilities move from secondary education to postsecondary education and/or employment, the first challenge students and transition professionals face is the use of different terminology across various settings. The resulting confusion may prevent students and professionals from recognizing service gaps (Hart, Zimbrich, & Whelley, 2002). The lack of common terms across service systems therefore contributes to a lack of understanding among service coordinators and poses a barrier to collaboration (Johnson, Zorn, Tam, LaMontagne, & Johnson, 2003; Stodden & Dowrick, 1999).

Collaboration is a generic concept referring to the notion that organizations, professional disciplines, and/or individuals work together toward a common goal. The concept of collaboration is consensually valued as an effective way to work in the fields of health, social science, education, public affairs, and business. Researchers have pointed out the different levels of working relationship and various degree of involvement in the collaborative efforts (Bruner, 1991; Dryfoos, 1994; Kagan, 1992; Swan & Morgan, 1993). However, the concept of collaboration is perceived and defined discrepantly across diverse professions. These discrepancies may be due to the nature of different service systems, such as differences regarding eligibility requirements in each field (Miller, 1990; Rush, Kohler, & Hughes, 1992; Szymanski, King, & Parker, & Jenkins, 1989), differences in roles and responsibilities of key service personnel (Johnson & Atkins, 1987; Miller, 1990), differences in preservice training requirements (Szymanski, Hanely-Maxwell, & Asselin, 1990; Trach, 1998), and differences in basic policy philosophy and values that drive service provision within each system (DeStephano & Snauwaert, 1989).

There is growing recognition that the complexity of service systems is an impediment to developing comprehensive, state and local service coordination for individuals with disabilities once they leave high school (Stodden & Dowrick, 1999). While the collaborative role of special educators in secondary school has been further expanded with the development of comprehensive systems of care and the advent of new laws (Asselin, Todd-Allen, & deFur, 1998; Conderman & Katsiyannis, 2002; Kontt & Asselin, 1999; Simpson, Whelan, & Zabel, 1993; Zhang, Ivester, Chen & Katsiyannis, 2005), few empirical research has been conducted directly to define these roles in collaboration with other professionals. The primary focus of past research has been on the skills and competencies that contribute to effectively coordinating and facilitating transition services. There is little attention to the interplay of special educators with other professionals in collaborative work.

Foley and Mundschenk (1997) conducted a national survey to investigate collaboration activities and competencies of secondary special educators. The findings revealed that self-perceived professional weakness in interagency collaboration explained the dysfunction of interagency collaboration at school.

Special educators were lacking of opportunities to develop such a collaborative role from their limited interaction with community service providers. Again, the self-perceived professional weakness can be due to the structural differences, lack of joint training, and scarcity of human and material resources (Farmakopoulou, 2002).

The other discouraging issue is that the psychometric evaluation and validation evidence for instruments measuring interagency collaboration are weak among extant empirical studies. Related studies embraced interagency collaboration as part of their instruments. For example, deFur and Taymans (1995) and Knott and Asselin (1999) developed survey scales of transition involvement including interagency collaboration. Whilst the psychometric evaluation was not reported in these two studies, its lack of evidence of reliability and validity limits proper use of the scales for further investigation on these important issues.

Welch and Tulbert's (2000) investigation designed to socially validate the characterization and operational definitions of collaboration and quantitatively identify salient features of collaboration. They employed the Delphi methodology in the phase asking practitioners to define and describe the collaborative process. Thirty-five thematic units were identified and were used to create a second instrument with their definitions into a Likert-type response format. Participants were asked to rate the importance of each of the 35 items in relation to collaboration using Likert scale ranging from 1 (no relation to collaboration) to 6 (always a relation to collaboration). A factor analysis with an oblique rotation was computed on 374 returned questionnaires. The factor analysis identified four factors with eigenvalues greater than 1.0. All 35 thematic units loaded on Factor 1 with a correlation greater than .40. This factor has been categorized as Collaboration in General. The other three factors included 2 or 3 items each from the same 35 items with loadings at .40 or higher in that particular factor, named separately as Management, Resources, and Collaborative Ethic.

Although Welch and Tulbert (2000) provided evidence of validation for their survey instrument, its results of the exploratory factor analysis may obscure the real relationship among the four factors as far as the construct of collaboration is concerned. They articulated that respondents in the survey appeared to address the issue of collaboration from a pragmatic perspective rather than a policy or philosophical viewpoint. It is suggested that future research must continue to explore the pragmatic dimensions of cultural, systemic, and philosophical aspects related to collaboration from the perspective of practitioners (p. 370).

An extended review of literature found an instrument designed to measure interdisciplinary collaboration in the field of social work. Bronstein (1999) developed the Index of Interdisciplinary Collaboration (IIC), which was used to assess differences in social workers' perception of interagency collaboration. The IIC was norm-referenced on 1,000 members of the National Association of Social Workers. Bronstein discovered a 5-factor measurement model including, Interdependence, Newly Created Professional Activities, Flexibility, Collective Ownership of Goals, and Reflection on Process.

Bronstein provided evidence to show that the IIC was reliable for her sample by test-retest reliability ($r = .82$) and internal consistency reliability ($\alpha = .92$). However, validity evidence was limited to results of an exploratory factor analysis and correlations among five factors. Therefore, the 5-factor structure model needs to be further confirmed by using the confirmatory factor analysis on a new sample of special educators. Moreover, given the different nature of populations (social workers and special educators), it is needed to provide evidence of reliability and validity specifically for the population of special educators.

The review of literature suggests the need for a validated instrument that can measure the perceptions of secondary special educators on interagency collaboration in providing transition services for students with disabilities. The current study attempts to fill that void that may help explain different levels of success among transition service interventions. Thus, the purpose of present research was to develop and provide some initial validation evidence for the instrument that could measure the perceptions of secondary special educators on interagency collaboration.

Overview of Method

Three stages of studies were conducted for the creation, refinement, and validation of the Interagency Collaboration Scale (ICS) to assess the perceptions of secondary special educators on interagency collaboration. The initial study was conducted to generate and assess items that seemed to adequately capture the primary domains of collaboration. The second stage consisted of scale refinement and involved exploratory factor analysis to revise the preliminary questionnaire. The third stage contained 343 valid responses on the final instrument to confirm scale dimensionality by using confirmatory factor analysis (CFA). Special educators' responses on the instrument were discussed to explore their perception on the interagency collaboration of transition services for students with disabilities.

The target population of this study was confined to secondary special educators in the United States. The participants of this study were chosen from members of the Council for Exceptional Children (CEC), which is a national organization whose members include parents, counselors, other professionals and scholars. The CEC member list was purchased as the sampling frame. According to Morningstar and Clark (2003), two types of secondary special educators are usually involved with transition education and services, including: (a) secondary special education teachers engaged in IEP transition planning and/or actual instruction in transition competency areas for students, and (b) transition education and services coordinators or specialists who are expected to assure "a coordinated set of activities" as required under IDEA. In this study, both special education teachers and transition coordinators who reported on their demographic profiles were extracted from the CEC member list. Six hundred members were randomly sampled for stage 2 investigation, and another additional 1000 members for final stage of this study.

Stage 1: Item Generation and Content Validation

The purpose of this phase of the study was to define and then adequately capture the content domains that would best reflect the perceptions of secondary special educators on interagency collaboration. An examination of extensive literature across diverse professional fields, the 5-factor model of Bronstein (1999) measuring perceptions of interagency collaboration was adapted to the development of items in the current study. Items were selected and generated from empirical studies such as Bronstein (1999), and Knott and Asselin (1999). The preliminary instrument constructed with 31 items in a 5-point Likert-typed scale ranging from 1 (strongly disagree) to 5 (strongly agree) with the statement. Items were written such that higher scores indicated more positive perceptions toward collaboration, with 5 items being reversed scored.

The preliminary instrument was given to a panel of experts, which was comprised of a former transition coordinator, doctoral students with teaching experiences and professors in special education. They were selected based on their experiences of transition practices, teaching students with disabilities, and well-grounded knowledge about transition. Both theoretical knowledge and practical experiences in special

education and transition practices were taken into account for experts' qualifications in order to help examine the items.

The instrument was also field tested to a convenience sample of 15 Master's students in a special education class to further assess the appropriateness of content. A dollar and a tea bag were included with each as incentives and appreciation. Another 10 additional copies were provided to participants to take back to their service schools for additional feedback from their colleagues. A total of 24 copies of the questionnaire were returned. Opinions and suggestions were collected to revise and edit the statement; some items were deleted or reworded as a result of comments made by reviewers regarding the meaning of particular items. The questionnaire ICS was then reduced to 25 items.

Stage 2: Scale Refinement

Participants

The sample for the second stage of study consisted of 600 secondary special educators, randomly selected from the member list of the CEC through the SPSS 10.0 software program and divided into four groups with 150 people in each group. Different incentives for encouraging responses to the survey were applied to these four groups: 50 cents, a dollar, a tea bag, and raffle ticket for 50 dollars. The total response rate was 50% and χ^2 tests were conducted between groups. According to the test results, the four groups did not differ in their response rate, $\chi^2 = 6.22$ (3, $n = 260$), $p > .05$. With other things being equal, the raffle ticket was determined as the most cost effective incentive for the third stage of the study.

A total of 326 surveys were returned, including 26 undeliverable surveys. Of the 300 valid respondents, 263 reported completed usable data (the incomplete surveys and respondents who are in elementary schools or colleges are excluded). Most of respondents were female (82%) and older than 40 years old (75%) with a four-year college degree plus background (98%). The roles of participants included special educators (51%), transition coordinators (27%), both special educators and transition coordinators (16%), and others (unidentified, 6%). They had been involved in providing transition services on an average of 9.6 years ($SD = 7.1$, ranging from 0 year to 32 years).

Statistical Analyses

Data were submitted to a principal axis factoring analysis with oblique rotation to generate the factor matrix using the SPSS 10.0 software program. Because multivariate normality and the absence of multicollinearity were two major assumptions when running a SEM based analysis (Boomsma & Hoogland, 2001; Kline, 1998) in stage 3, items with absolute skewness values greater than 3 were considered extremely skewed and absolute value of kurtosis greater than 10 may suggest a more obvious problem (Byrne, 1998; Kline, 1998). Exploratory factor analysis in SPSS software, communalities or squared multiple correlation were selected, measure of sampling adequacy (MSA) in anti-image was set to be greater than .60 (Tabachnick and Fidell, 2001, p.589), and factors with eigenvalues greater than 1 were extracted. Promax rotations were used to determine the best fit (Pedhazur & Schmelkin, 1991; Tabachnick & Fidell, 2001).

Exploratory Factor Analysis and Further Revision

Most items of the ICS were correlated from weakly to less than moderately ($r < .65$) and showed a normal distribution, indicating that the assumptions of normality and free of multicollinearity appeared to be generally met (See Table 1). Therefore, data were submitted to a principal axis factoring analysis to generate the factor matrix.

Table 1

Descriptive Analysis of Interagency Collaboration Scale Items

Items	Mean	SD	Skewness	Kurtosis
1. I value other professionals from different disciplines for their particular expertise.	4.57	0.61	-1.94	7.30
2. Feedback from other professionals is very important to me.	4.49	0.60	-1.18	3.10
3. Teamwork with professionals from other disciplines is not important in my ability to help students.	4.27	1.11	-1.83	2.68
4. Professionals from other disciplines with whom I work have a good understanding of the distinction between my roles and their roles.	3.43	.97	-0.92	0.30
5. Cooperative work with other disciplines is not a part of my job description.	4.23	1.03	-1.50	1.81
6. Incorporating views of treatment held by professionals from other disciplines will help meet students' needs.	4.15	0.78	-1.14	2.64
7. Distinct new programs emerge from the collective work of professionals from different disciplines.	3.94	0.93	-0.82	0.58
8. Organizational protocols (e.g., written documents such as policy agreements, memoranda of understanding, etc.) reflect the existence of cooperation between professionals from different disciplines.	3.53	0.96	-0.40	-0.14
9. Working with professionals from other disciplines leads to outcomes that we could not achieve alone.	4.31	0.78	-1.72	4.80
10. Creative outcomes emerge from my work with professionals from other disciplines that I could not have predicted.	3.99	0.85	-0.82	0.71
11. I am willing to take on tasks outside of my job description when that seems important.	4.45	0.61	-1.24	3.86
12. It is helpful utilizing both formal and informal procedures for problem solving with professionals from other disciplines.	4.38	0.68	-1.44	4.36
13. Professionals from other disciplines stick rigidly to their job descriptions.	3.17	0.88	-0.31	-0.19
14. I am not willing to sacrifice a degree of autonomy to support cooperative problem solving.	3.97	0.95	-1.07	1.10
15. It is important for me to work with professionals from other disciplines in many different ways.	4.31	0.76	-1.37	2.87
16. Decisions about approaches to treatment for students are unilaterally made by professionals from other disciplines.	2.66	1.04	0.23	-0.72
17. Professionals from other disciplines are not committed to working together.	3.79	0.90	-0.45	-0.36
18. When professionals from different disciplines make decisions together, they go through a process of examining alternatives.	3.85	0.73	-0.68	1.06

19.Interactions with professionals from other disciplines occur in a climate where there is freedom to be different and to disagree.	3.66	0.86	-0.63	0.26
20.Professionals from other disciplines take responsibility with me for developing IEPs/ITPs.	3.00	1.26	-0.31	-1.16
21.It is necessary for professionals from other disciplines and me to discuss different strategies to improve our working relationships.	4.03	0.80	-1.07	1.97
22.I am optimistic about the ability of professionals from other disciplines to work with me to resolve problems.	3.95	0.84	-0.83	0.97
23.Professionals from other disciplines are as likely as I am to address obstacles to our successful collaboration.	3.60	0.90	-0.61	0.06
24.It is important for professionals from other disciplines and me to talk together about our professional similarities and differences including role, competencies and stereotypes.	3.90	0.86	-0.86	1.05
25.It is necessary for professionals from other disciplines and me to evaluate our work together.	4.08	0.74	-1.02	2.27

When checking the anti-image and initial solution of communities from the results of exploratory factor analysis, the MSA of item 16 was less than .60. The square multiple correlations of items 3, 8, 13, 14, and 16 were all less than .30. The scree plot revealed the numbers of factors were around four to five. After several runs of exploratory factor analysis, the four-factor solution was determined most appropriate. Item 13 was remained as the description presents one of the important indicators to the success of interagency collaboration among literature and suggestion from special educators. Items 3, 8, 14, and 16 were removed. Table 2 presents the pattern and structure coefficients from this exploratory factor analysis with 21 items.

Table 2

Exploratory Factor Analysis Pattern and Structure Coefficients

Item #	Pattern Coefficients				Structure Coefficients			
	I	II	III	IV	I	II	III	IV
1	.834	.060	-.070	-.088	.791	.391	.298	.252
2	.823	-.011	-.042	-.067	.771	.327	.308	.263
12	.668	-.083	.074	.102	.708	.250	.384	.386
15	.618	-.004	.074	.006	.652	.288	.354	.285
6	.462	.037	.108	.122	.579	.292	.362	.354
11	.436	.115	-.032	.089	.541	.195	.284	.472
7	.434	-.059	.018	.297	.510	.316	.221	.285
17r	-.060	.673	-.078	.012	.362	.669	.312	.107
23	.054	.622	.152	-.080	.206	.629	.071	.097
19	-.063	.600	.021	.072	.528	.607	.439	.283
20	.034	.517	.012	-.107	.241	.592	.166	.169
4	.017	.500	-.026	.068	.351	.557	.187	.249
18	.089	.498	-.015	.118	.222	.514	.130	.012
22	.214	.449	.215	.044	.253	.514	.129	.165
13r	-.018	.399	-.031	.021	.152	.387	.069	.083
5r	.220	.245	.123	-.098	.343	.354	.257	.077

24	-.047	.037	.842	-.094	.336	.184	.805	.300
25	-.067	-.014	.811	.100	.311	.214	.804	.134
21	.105	-.060	.558	.083	.365	.145	.613	.273
9	.047	.113	.119	.703	.444	.302	.369	.779
10	.211	.172	.097	.476	.530	.383	.372	.625

Note. Primary factor coefficients are in bold; r = reverse-scored item.

The results of exploratory factor analysis and internal consistency test (Cronbach's α) revealed a 4-factor model instead of a 5-factor model, including: Importance of interdisciplinary collaboration, Collective ownership of goals, Evaluation on collaboration process, and Newly created professional activities. These four factors explained 54.26% of the variance in the data. These four factors were elaborated as follows:

1. Importance of interdisciplinary collaboration. Refers to the degree or level of importance of collaboration among professionals to accomplish their goals and tasks. Seven items were used to measure the perceptions of secondary special educators for this factor (items 1, 2, 6, 7, 11, 12, and 15). For example, "I value other professionals from different disciplines for their particular expertise." The internal consistency reliability was good for this subscale (Cronbach's α = .83).

2. Collective ownership of goals. Refers to shared responsibility in the entire process of reaching goals, including joint design, definition, development, and achievement of goals. Eight items were used to measure special educators' perceptions for this factor (items 4, 13, 17, 18, 19, 20, 22, and 23). For example, "Professionals from other disciplines are not committed to working together." The internal consistency reliability was acceptable for this subscale (Cronbach's α = .79).

3. Newly created professional activities. Refers to collaborative acts, programs, and structures that amount to more than what is created when the same professionals act independently. Two items were used to measure special educators' perceptions for this factor (items 9 and 10). For example, "Working with professionals from other disciplines leads to outcomes that we could not achieve alone." The internal consistency reliability was acceptable for this subscale (Cronbach's α = .76).

4. Evaluation on collaborative process. Refers to collaborators' attention to the process of working together. Three items were used to measure special educators' perceptions for this factor (items 21, 24, and 25). For example, "It is necessary for professionals from other disciplines and me to evaluate our work together." The internal consistency reliability was acceptable for this subscale (Cronbach's α = .78).

After the statistical analyses, the items of ICS were also revised based on recommendations and feedback of researchers, scholars, and practitioners in the field of transition at the international conference of Division on Career Development and Transition. Item 5 was not included in any of the four factors previously due to its low loading value, but researchers and practitioners strongly recommended keeping this item, therefore the wording was changed based on the feedback from "cooperative work with other disciplines is not a part of my job description" to "my job description includes a part of cooperative work with other disciplines." Item 1 was removed because of failing to solicit relevant responses from participants due to the possibility of social desirability. Item 3 was resumed under suggestion from colleagues, by modifying its wording from "teamwork with

professionals from other disciplines is not important in my ability to help students” to “the ability to teamwork with other professionals from other disciplines is not important to help students.” Therefore, the ICS for secondary special educators’ perceptions of interagency collaboration consisted of 21 items and its factor structure was hypothesized as four factors.

Stage 3: Scale Validation

Participants

One thousand survey questionnaires were distributed to the randomly selected potential participants from the CEC list, with the raffle ticket for \$ 100 cash award as incentive. Five hundred and fifty-one, including 53 undeliverable surveys, were returned for the validation study.

Of the 498 respondents (53% of response rate), 443 reported valid data (47%), and 343 responses (34%) were either secondary special education teachers or transition coordinators/specialists. The 343 responses were included in the data analysis of this final stage study. Eighty-three percent of respondents were female and 17% of respondents were male. Most of respondents were older than 40 years old (76%) and held a bachelor’s degree (99%). The roles of respondents included special educators (70%), transition coordinators (17%), and both special educators and transition coordinators (13%). The majority of respondents had been involved in providing transition services more than 13 years (34%). Most respondents also reported devoting less than 10 hours (49%) per week to transition-related responsibilities. For the years of experience with interagency collaboration (i.e., vocational rehabilitation counselor, community college, mental health), the majority of respondents had more than 13 years of experience with interagency collaboration (30 %).

Statistical Analyses

The ICS contained 21 items after revision. In terms of factor structure, exploratory factor analysis (EFA) was first performed to assess the factor structure of this new measurement model for perceptions of interagency collaboration and Cronbach’s α was also provided for each factor. Data were submitted to a principal axis factoring analysis to generate the factor matrix. Factors with eigenvalues greater than 1 were extracted. Both varimax and promax rotations were used to determine the best fit. In order to maximize simple structure, a factor loading with an absolute value of .30 or greater was set to identify significance of contribution to define a variable (Pedhazur & Schmelkin, 1991; Tabachnick & Fidell, 2001).

The software package SPSS 10.0 was used to conduct internal consistency reliability analysis (Cronbach’s alpha) of scores from scales to provide related reliability evidence. Based on such evidence of reliability, participants’ responses to the sets of items, which comprise a measure of an attribute or a construct, are regarded as internally consistent (Pedhazur & Schmelkin, 1991). Generally, Cronbach’s alpha equal to and above .70 suggests sufficient reliability (John & Benet-Martinec, 2000). Therefore, an alpha of .70 was set as the minimum standard for all scales in this study.

Four major steps were performed in conducting the Confirmatory Factor Analysis (Byrne, 1998). First, the model including the number of factors, the connection between the observed variables (items) and their underlying factors, and the correlations between factors was specified based on the established theory. Second, PRELIS 2.52 (Jöreskog & Sörbom, 2002) was used to inspect any potential problems with items such as lack of variance and normality and to create a covariance matrix. Third, the LISREL commands were specified. Fourth, the model fit was evaluated by a combination of fit indices, and a

good fit suggested evidence of validity. Hu and Bentler (1999) recommended a mix of different fit indices as follows: root mean square error of approximation (RMSEA); standardized root mean square residual (SRMR); non normed fit index (NNFI); normed fit index (NFI); and comparative fit index (CFI). The RMSEA indicated a reasonable fit with values between .05 and under .08 (Browne & Cudeck, 1993; MacCallum, Browne, & Sugawara, 1996). The values of NNFI, and CFI indicate an acceptable fit with a value .95 and a good fit with a value above .95 (Hu & Bentler, 1999).

Instrument Validation

In the SPSS output of exploratory factor analysis, communalities and measure of sampling adequacy (MSA) in anti-image for each item were examined. Item 11 was deleted (MSA < .60) and item 4 was deleted because the squared multiple correlation was found to be less than .20. Item 1 was deleted to increase reliability based on the results of item-total statistics. Lastly, Item 14 was deleted ($\lambda < .30$). A final four-factor ICS with 17 items was obtained with the deletion of items 1, 4, 11, and 14.

Subsequently, a confirmatory factor analysis was conducted to assess the model specification. The respondents' responses were used to establish a covariance matrix for the items, and then the confirmatory factor analyses examined how well the inter-item covariance matrix fit the single factor model for each scale. Much attention was given to the results of confirmatory factor analysis, such as the t-values, parameter specification, squared multiple correlations, and completely standardized factor loadings. The t-values for observed variables were all significant. The values of the squared multiple correlations ranged from .27 to .69, while the completely standardized loadings ranged from .52 to .83. The first factor of importance of interdisciplinary collaboration was comprised of 4 items and generated a Cronbach coefficient's alpha of .72. The second factor of collective ownership of goals was comprised of 6 items and generated a Cronbach coefficient's alpha of .76. The third factor of newly created professional activities was comprised of 4 items and generated a Cronbach's coefficient alpha of .74. The fourth factor of evaluation on collaborative process was comprised of 3 items and generated a Cronbach's coefficient alpha of .74. These four factors explained 54.67% of the variance in the data. The overall fit of this measurement model was $\chi^2 (113, n = 338) = 213.59, p < .05$; RMSEA = .051; NNFI = .96; NFI = .93; CFI = .97; SRMR = .054, indicating a good fit of the model to the data. The summary tables and factor structure are presented in Table 3.

Table 3

Confirmatory Factor Analysis and Internal Consistency for ICS

Factor and Item		λ	α
<u>Importance of Interdisciplinary Collaboration</u>			.72
2.	2 Feedback from other professionals is very important to my work.	.54*	
9.	11 I am willing to take on tasks outside of my job description when it is necessary.	.60*	
10.	12 It is helpful utilizing both formal and informal procedures for problem solving with professionals from other disciplines.	.77*	
12.	15 It is important for me to work with professionals from other disciplines in many different ways.	.63*	
<u>Collective Ownership of Goals</u>			.76
3.	4 Professionals from other disciplines with whom I work have a good understanding of the distinction between my roles and their roles.	.52*	

13.	17	Professionals from other disciplines are not committed to working together.	.52*
15.	19	Interactions with professionals from other disciplines occur in a climate where there is freedom to be different and to disagree.	.67*
16.	20	Professionals from other disciplines take responsibility with me for developing IEPs/ITPs.	.57*
18.	22	I am optimistic about the ability of professionals from other disciplines to work with me to resolve problems.	.75*
19.	23	Professionals from other disciplines are as likely as I am to address obstacles to our successful collaboration.	.57*
<u>Newly Created Professional Activities</u>			.74
5.	6	Incorporating views of treatment held by professionals from other disciplines will help meet students' needs.	.52*
6.	7	Distinct new programs emerge from the collective work of professionals from different disciplines.	.67*
7.	9	Working with professionals from other disciplines leads to outcomes that we could not achieve alone.	.79*
8.	10	Creative outcomes emerge from my work with professionals from other disciplines that I could not have predicted.	.66*
<u>Evaluation on Collaborative Process</u>			.74
17.	21	It is necessary for professionals from other disciplines and me to discuss different strategies to improve our working relationships.	.59*
20.	24	It is important for professionals from other disciplines and me to talk together about our professional similarities and differences including role, competencies and stereotypes.	.69*
21.	25	It is necessary for professionals from other disciplines and me to evaluate our work together.	.83*
<u>Percent of Total Variance (4 factors)</u>			54.67%

Note. Number in the first column indicated the new order of the scale, the second column the original number.

Descriptive analyses of participants' response on the four factors in the final instrument of ICS were presented in Table 4 for further discussion.

Table 4

Descriptive Analysis for Indicators of Interagency Collaboration Scale (n =343)

Indicators	ATS	SD	Skewness	Kurtosis	Mean	SD
Importance of interdisciplinary collaboration (4)	17.42	1.85	-0.18	-0.56	4.35	.49
Collective ownership of goals (6)	21.36	3.88	-0.61	0.65	3.56	.65
Newly creative professional activities (4)	16.43	2.23	-0.30	0.09	4.11	.57
Evaluation on collaborative process (3)	11.89	1.92	-0.43	0.41	3.96	.64

Note. ATS= average total score; Mean= total score divided by item number; The number in the parentheses is the numbers of item used for parceling.

Discussions

Several important features of the Interagency Collaboration Scale emerge from the results reported above. Instead of a “Collaboration in General” factor as reported in Welch and Tulbert (2000), the exploratory factor analysis of this study revealed a four-factor measurement structure and confirmed by the confirmatory factor analysis. These four factors overall reflected special educators’ perceptions of interagency collaboration in this study.

Although the collaboration model was developed based on Bronstein’s five-factor model (1999), which was generated with social workers as sample population, the factor analysis revealed that a 4-factor solution produced the most interpretable pattern of factor scores, accounting for 54% of the common variance in the data set. The scale scores yielded reliability estimates that ranged from .72 to .76. Among the four factors revealed in this study, three of them are the same as the defined factors in Bronstein’s (1999) study, which are collective ownership of goals, newly creative professional activities, and evaluation on collaborative process. This finding is worthy of further confirmation across different professional populations to investigate whether or not these three factors can be deemed as stable factors for the construct of interagency collaboration.

Besides these three factors, Bronstein (1999) suggested two other factors as Interdependence and Flexibility, which in current study are presented as a single factor. Interdependence was defined by Bronstein (1999) as professionals with a clear understanding of distinguished roles between professions and strong identification of collaborative roles. Both formal and informal procedures are involved. The factor of Flexibility was defined as the ability to reach productive compromises in the face of disagreement and the alteration of role. These two constructs discernibly integrated into the current emergent factor of Importance of Interdisciplinary Collaboration with 4 items (item 2, 9, 10, 12), which meets the principle of parsimony.

For the factor of Importance of Interdisciplinary Collaboration, the mean response (4.35, SD = .49) indicated educators’ high agreement on the importance of interdisciplinary collaboration. This factor of ICS integrated two factors of Interdependence and Flexibility from Bronstein’s (1999) study, reflecting special educators’ recognition on certain contextual factors shape the development of collaboration (Abramson & Rosenthal, 1995; Mattessich & Monsey, 1992; Swan & Morgan, 1993) and further influence educators’ perceptions of interdisciplinary collaboration. Political climate changes, such as the requirement of transition services mandated by IDEA, and emphasis on transition outcomes for students exiting schools, led to greater interdependence among professions. The scarcity of resources, economic insecurity, and competition for funding may be additional incentives to work together and increase willingness of being flexible.

However, even if political and economic incentives exist, collaborations will form only if different stakeholders share collective ownership of goals (Abramson & Rosenthal, 1995; Swan & Morgan, 1992). The mean response for the second factor of collective ownership of goals was 3.56 (SD = .65), indicating their moderate agreement on this factor. Special educators surveyed in this study reported a congruent view with previous studies. It is important to note that among the four factors, this factor was identified with the lowest mean score among educators. Collective ownership of goals involved educators’ sharing responsibility with professionals from other disciplines in the entire process of reaching goals, including joint design, definition, development, and achievement of goals. While special educators may share responsibility with other professionals to some extent in the transition planning process, barriers such as different legislative mandates, rules, policies, and timing in providing

service between different agencies or systems still pose barriers to such relationships. It is possible that special educators did not feel strongly enough to have such collective ownership of goals with professionals from other disciplines.

The third factor of ICS requires educators' further participation in newly created professional activities to achieve the goals they shared with interdisciplinary partners. The mean response for this factor was 4.12 (SD = .57), which indicated evidence that collaborative activities existed between educators and other interdisciplinary professionals. This finding demonstrated a positive improvement in collaborative professional activities compared with a previous study, in which slightly more than half (50.9%) of the educators surveyed indicated that they had no interactions with other non-school transition professionals (Foley & Mundschenk, 1997).

The last factor of ICS reflects the construct of evaluation of the collaborative process. Educators surveyed in this study also had a high agreement on this factor (M = 3.96; SD = .64). Since the 1997 IDEA changes in transition language focused on the new roles for secondary special educators (Asselin, Todd-Allen, & deFur, 1998; Conderman & Katsiyannis, 2002), educators have been being challenged with the task of facilitating the transition of students with disabilities from school to post-school lives. Special educators shift their roles from direct service providers to facilitators working with professionals from multi-disciplines to helping students obtain positive transition outcomes. Such positive transition outcomes depend on a good collaborative process, which reflects the importance of evaluation on collaborative process between educators and other professionals.

Conderman and Katsiyannis (2002) examined secondary special education teachers' knowledge of transition practice and found that approximately 50 percent of teachers were not aware of any post-secondary data collected on their students. The results revealed in the present study showed an inconsistency finding. Although educators showed a high agreement on the factor of evaluation of the collaborative process, they were not asked about the level of involvement in the evaluation for the collaborative process. This information would have been useful in interpreting their high level of agreement about evaluation of the collaborative process. How educators perceive transition outcomes for students may be an indicator of the level of involvement in the evaluation of the collaborative process and further provide an understanding of educators' interagency collaboration.

As with all scientific studies, there are several limitations exist in this study. The first limitation of the study is that the sample consisted of members of the Council for Exceptional Children (CEC). Although the geographical distribution of the sample was found in a variety of different states, the CEC is a professional organization, of which membership of special educator is voluntary in the United States. Therefore, the representativeness of the sample to the nationwide population is dubious. Generalization of the findings to secondary special educators who are not members of CEC should be made with caution.

The second limitation of the study involves the nature of self-reported data. Educators were asked about their perceptions, opinions, beliefs, and expectations on interagency collaboration of transition services. Some degree of common-method variance may have inflated the observed correlations in the present study. It is possible that the responses of participants may not adequately reflect their true beliefs and attitudes.

In sum, past research and commonly held views that the role of interagency collaboration has an influential impact on successful outcomes of transition programs. The current study offers a preliminary tool for use in understanding special educators' perception on this important issue. The ICS

attempts to fill a gap in the literature examining the perceptions of special educators by examining the multidimensionality of interagency collaboration revealed in present study. Measurement instruments like the ICS should pave the way for future research relating to the unique challenges faced by members on this growing issue of transition intervention. This current study results show the ICS as a promising assessment tool, but it should undergo to further explore its psychometric properties. For example, additional research should evaluate what roles that educators' personal and professional characteristics, including their transition professional background and special education commitment, play in their perceptions of interagency collaboration and their involvement in the transition programs. Thus, measures such as the ICS are needed and seem worthy of future investigation.

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Resistance to Change: Overcoming Institutional and Individual Limitations for Improving Student Behavior Through PLCs

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Abstract

Many public schools currently have organizational structures that form barriers for dealing more effectively with students' challenging behaviors even though positive school-wide approaches exist and provide empirical support for their use. Nevertheless, resistance to change occurs at both institutional and individual levels. Improving student behavior and learning requires a paradigm shift away from teachers working in isolation to working together. Professional growth also must shift away from one-shot inservices to more intense and long-term training. One method for achieving this type of paradigm shift is through the use of professional learning communities (PLCs). Through these communities, schools can challenge existing paradigms and explore the possibilities that positive supports offer to dealing with students' challenging behaviors. Therefore, the purpose of this article is to describe prominent and misconceived beliefs that contribute to institutional and individual resistance and suggest professional learning communities (PLCs) as a means for moving past this resistance in a collaborative and empowering way to improve student behavior and learning.

Resistance to Change: Overcoming Institutional and Individual Limitations for Improving Student Behavior Through PLCs

Why do people resist and what exactly is it? Physicists understand Ohm's law in which resistance is equal to the voltage divided by the current. An electrician views resistance as a component that opposes the passage of an electric current. Educators view resistance as an unpleasant trait displayed by some students who are noncompliant and uncooperative when given directions to behave in certain ways. Serious oppositional behavior is one of the most frequent reasons young children are referred for psychiatric services (Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987). Walker, Ramsey, and Gresham (2004) believed that noncompliance serves as a "gateway behavior" for children developing serious antisocial behavior. Maag (2001a) believed that terms such as "noncompliance" and "opposition" suggested that the problem resides solely with children whereas the term "resistance" focuses on the interaction between adult and child behaviors.

The belief that resistance originate from adults—as well as children—is both comforting and disconcerting. The good news is that the first step for dealing effectively with resistance involves changing adult behavior—something totally under their control versus trying to change children's behavior which is mitigated by a myriad of factors outside of a school's control. The bad news is that it is difficult for people to change. Similarly, it is difficult for institutions (i.e., public schools) to change their behavior or culture. Individual change is resisted because of the risk that is involved. Institutional

change is resisted because it disrupts the homeostasis (i.e., equilibrium) under which schools function. In turn, schools fear that lack of disciplinary control will result in state legislations and the federal government pulling funding for schools as illustrated in No Child Left Behind (NCLB). In addition, in a national survey conducted by the Public Agenda (2004), 76% of teachers indicated they would be better able to educate students if discipline problems were not so prevalent. Consequently, there has been an explosion of districts implementing school-wide discipline programs.

The typical approach to school-wide discipline focuses on adopting a zero-tolerance policy that includes the use of such reactive approaches as detentions, suspensions, expulsion, loss of privileges, office referrals, and other forms of punishment (McCurdy, Kunsch, & Reibstein (2007). The assumption is that responding to repeated problem behavior with increasingly severe consequences will teach students that their unruly behaviors are unacceptable and will not be tolerated. Ultimately, it is assumed—at least anticipated—that students will “get it” and stop the displays of dangerous behaviors. However, Sugai and Horner (2006) pointed out that these types of punishment—particularly when used inconsistently and without a positive component—are not only ineffective but also that students with the most severe problem behavior are the least likely to be responsive and, in fact, may get worse.

Unlike punitive and exclusionary approaches, school-wide positive behavior support (SWPBS) focuses on the application of research-based behavioral approaches to teach students skills necessary to behave appropriately in different school contexts (e.g., classroom, recess, cafeteria, hallways) and reinforce their use (Sugai & Horner, 2002). The central message is that schools must become proactive in acknowledging and reinforcing appropriate behavior rather than simply reacting with punishment to student misbehavior (Sugai, Sprague, Horner, & Walker, 2000). The SWPBS model is implemented at three levels or tiers. Tier I focuses on primary prevention and uses universal interventions at the school—and classroom-wide settings. Tier II focuses on group interventions for students who are at-risk for developing serious behavioral problems. Tier III provides specialized individual interventions, usually beginning with functional assessment and culminating with a behavior intervention plan (BIP) to individual students with the most challenging behaviors.

Researchers have found that SWPBS has been effective at the school-wide level across a number of settings for both increasing students’ prosocial behaviors and academic achievement and decreasing their inappropriate behaviors (e.g., Lewis, Sugai, & Colvin, 1998; Kartub, Taylor-Greene, March, & Horner, 2000; Lassen, Steele, & Sailor, 2006; Lewis, Powers, Kelk, & Newcomer, 2002; Luiselli, Putnam, Handler, & Feinberg, 2005; Netzel & Eber, 2003; Warren et al., 2006). In addition, Simonsen, Sugai, and Negron (2008) described how findings from several randomized control trial studies—the gold standard adopted by the U.S. Department of Education for considering a program to be evidence-based—are being conducted and published shortly. Finally, Scott and Barrett (2004) did a cost-benefit analysis indicating that SWPBS saved administrators an average of 15 ¾ days per year previously spent on student office-referral related activities and that students saved 79 ½ days of instructional time per year.

The research-based indicating the effectiveness of SWPBS can be starkly contrasted with schools that rely heavily or wholly on punitive and exclusionary discipline approaches—the latter of which actually contribute to higher rates of students’ challenging behaviors (e.g., Mayer, 1995; Mayer & Butterworth, 1981; Mayer, Nafpaktitis, Butterworth, & Hollingsorth, 1987). In a review of the research, Lipsey (1991) concluded that punishment was one of the three least effective approaches for dealing with school violence. Tellingly, Mayer and Sulzer-Azaroff (1991) found the school-wide discipline programs that relied on punishment without a positive component were associated with higher levels of student truancy and dropping out of school, vandalism, and aggression. A perverse irony is that the

very school-wide programs designed to “get tougher” to address student violence, disruptions, and vandalism may actually increase these behaviors, thus perpetuating an endless and self-defeating cycle of more and more severe negative consequences.

Why do school districts and schools continue to rely almost exclusively on the use punitive and exclusionary discipline systems which are not support by evidence when a compelling research-based exists for using more positive approaches such as SWPBS? Sprague et al. (2001) speculated that schools, in general, have a long history of applying simple and general solutions to complex student behavior problems and expressing understandable disappointment when these attempts do not work as expected. Punitive and exclusionary approaches are often viewed as easy to implement consistently across school staff. However, there are other factors responsible for educational resistance—both at the institutional and individual levels—for adopting more positive and empirically-validated approaches. Therefore, the purpose of this article is to describe prominent, and misconceived, beliefs that contribute to institutional and individual resistance and suggest professional learning communities (PLCs) as a means for educators moving past this resistance and working in a collaborative and empowering way to make positive changes in students’ behaviors and learning.

Institutional and Individual Resistance: The Power of Paradigms

Why are schools and teachers often resistant to change? Haynes (1998) believed resistance was due to educators’ exposure to one program after another with no perceptible improvements in outcomes. Other reasons he gave included misunderstandings or lack of information about a new program, weak or nonexistent commitment on the part of educators to change, and a lack of incentives for implementing different programs. However, Barker (1992) had a more encompassing idea of why institutions and individuals—regardless of the profession or discipline—resist change: paradigms.

Barker (1992) described paradigms as patterns or models for interpreting information. They provide people with rules and regulations that establish boundaries and explain how to be successful by solving problems within the given boundaries. Humans are constantly viewing the world through their paradigms—selecting from the environment those data that best fit their rules and regulations while trying to ignore the rest. Over 38 years ago, Kuhn (1970) wrote his seminal book, *The Structure of Scientific Revolutions*, and found that paradigms acted as filters that screened data coming into scientists’ minds concerning assumptions they held regarding their theoretical beliefs. Data that agreed with their paradigms were easily recognized and accepted. Conversely, data that did not match their expectations (i.e., that did not fit their paradigms) caused substantial difficulty. The more unexpected the data, the more difficulty scientists had perceiving and accepting them. In some cases, they simply ignored unexpected data as anomalous. Other times, they distorted the data to fit their paradigm rather than acknowledging the data as exceptions to the rules. In extreme cases, Kuhn found that scientists were incapable of perceiving the unexpected data—for all intents and purposes the data were invisible.

A deleterious aspect of paradigms is that they are not based on the examination of objective data. In fact, dominant paradigms are seldom stated explicitly. As Neale and Liebert (1973) wrote many decades ago: “Belief is easily confused with evidence, evidence is easily misunderstood, and misunderstanding is easily perpetuated (p. 189).” Consequently, paradigms are unquestioned ways of understanding a phenomenon that exist in any particular discipline. They are transmitted by means of culture and to succeeding generations from tacit experience rather than being taught or accepted

through the scientific method of discovery. Institutions and individuals take comfort in the dominant paradigms out of which they operate because they are used to anticipate and respond to new trends—such as NCLB in education. However, the visceral reassurance experienced by a dominant paradigm can lead to a false sense of comfort and, subsequently, erroneous interpretations of future trends and new opportunities regardless of the discipline. Barker (1992) provided some interesting predictions that experts in their fields had about the future when operating out of their dominant paradigms:

- The phonograph is not of any commercial value.
—Thomas Edison remarking on his own invention to his assistant, 1880
- No flying machine will ever fly from New York to Paris.
—Orville Wright, 1908
- No woman will, in my time, be prime minister.
—Margaret Thatcher, 10 years before being elected prime minister, 1969
- Who the hell wants to hear actors talk?
—Harry Warner, Warner Brothers Pictures, 1927
- I think there is a world market for about five computers.
—Thomas J. Watson, chairman of IBM, 1943

Back to Zero Rule

Why would these thoughtful and successful individuals be so blinded to the future that they helped to shape? The answer can be found in the “back to zero” rule (Barker, 1992). When a paradigm shifts, individuals and institutions in any discipline go back to zero and start over. Their past experiences and successes guarantee them nothing. Imagine teachers of a school attending the last meeting of the year. Their supervisor—the person who had great influence hiring them and who would have equally great influence initiating the process of terminating them if necessary—states the following:

- Folks, we had a good year and I hope you find the summer to be relaxing and reinvigorating. Oh, by the way, next fall when school begins, none of you will be using the teaching techniques for which you have become proficient. Rather, the district office has determined that everyone will adopt and use a new teaching method called X-49 Sop. We will be hiring new teachers to fill vacancies who have been trained in the X-49 Sop method. I am confident that you all will still want to teach at this school, but you’ll have to change . . .

Do most, if not all, of the staff at that school resist? Absolutely. Why? Because it represents a new way of teaching for which they have not become proficient nor comfortable.

Concept of Consistency and Negative Reinforcement

There are two other powerful reasons why institutions and individuals resist change. The first reason can be found in the cognitive psychology literature called the “concept of consistency.” The second reason, negative reinforcement, can be found in the applied behavior analysis literature.

All humans strive for consistency in their interpretations of situations and in their interactions with others (Critto, 2000). Consistency breeds predictability which, in turn, leads to feelings of comfort and a sense of self-assurance (Maag, 2001b). Many people resist change because it would take them out of their “comfort zone.” Therefore, even when educators do not get the response they want from students, they will nevertheless continue doing it because it is predictable and comfortable. This phenomenon results in the application of “linear” intervention which, put simply, are “more of the same” and seldom work (Watzlawick, Weakland, & Fisch, 1974).

Punishment provides a good example of a linear intervention. Punishment refers to any consequence, after a behavior occurs, that has the effect of decreasing or eliminating that behavior (Maag, 2001b). Therefore, when punishment works for a given student, the teacher would be using it less rather than more often in the future because the untoward behavior would be eliminated and, hence, reduce the necessity to punish. However, when a student misbehaves and is sent to the hallway for 10 minutes on Monday, 15 minutes on Tuesday, and 20 minutes on Wednesday, then the consequence did not function as punishment and was simply “more of the same.” Similarly, if a teacher gives a direction and a student does not follow it, the second technique may be for the teacher to repeat the direction and, if that did not work, the third technique is for the teacher to repeat it louder.

Another reason teachers resist lessening or eliminating the use of punishment—particularly exclusionary practices—as a form of discipline is because of the power of negative reinforcement. According to Skinner’s (1945) operant theory, people behave for one of two reasons: (a) to obtain something enjoyable (positive reinforcement) or (b) to escape something disliked (negative reinforcement). Contrary to popular belief, punishment and negative reinforcement are not synonymous but rather opposites: Punishment is a consequence that reduces or eliminates behavior and negative reinforcement is a consequence that maintains or increases behavior. For example, a teacher may find a student’s incessant misbehavior to be unpleasant and, consequently, sends the student out of the classroom to sit in the hall or principal’s office. The teacher’s behavior of sending the student out of the classroom has been negatively reinforced because that act terminated the unpleasantness of the student’s misbehavior. Any behavior that terminated an aversive is more likely to be performed in the future (Axelrod & Hall, 1999).

Perhaps negative reinforcement unknowingly is partially responsible for explaining the growth of exclusionary practices in schools. Around two decades ago, schools began to adopt “zero tolerance” discipline policies—largely in response to growing school violence (Skiba & Peterson, 1999). Zero tolerance was initially aimed at preventing and removing students who carried firearms in schools. The idea was that zero tolerance would send a message to other students who would finally “get it” and cease bringing weapons to school or engage in dangerous behaviors. However, schools did not limit exclusionary practices for just the most dangerous behaviors. Skiba and his colleagues described how some school districts extended zero tolerance measures of exclusion for such minor infractions as non-completion of homework, fighting, possession of cough drops, refusal to follow directions, school disruptions, and smoking (Skiba & Peterson, 2000; Skiba & Rausch, 2006). Other researchers have found that students have been suspended or expelled for dress code violations, profanity, excessive absenteeism, and shoving matches (Black, 1999; Insley, 2001). Sadly, these “get tough” penalties occur even for minor incidents of student misconduct without the safeguards of the Fourth Amendment (Beger, 2003).

Another insidious byproduct of exclusionary practices is what Patterson (1975) coined the “negative reinforcement trap” to explain coercive relationships that may evolve between teachers and students. In the previous example, a student was removed from the classroom for engaging in behaviors the teacher found unpleasant. If the student found the classroom disagreeable—either because of lacking the necessary skills or considered the lesson boring or too hard or too easy—then being removed from the classroom negatively reinforced the student’s performance of inappropriate behaviors because they terminated the perceived aversiveness of the classroom activities and demands.

Consequently, teachers and students have often been caught in a trap in which both individuals were negatively reinforced for engaging in counterproductive behaviors.

There are situations where students should be removed from a classroom: when their behavior poses a danger to themselves or others or severely compromises the integrity of an instructional lesson. In other words, exclusionary practices should be reserved for the most dangerous and destructive behaviors displayed by students (Stone, 1993). Sadly, some schools take even more punitive measures by physically restraining these students in often therapeutically and legally questionable ways (McAfee, Schwillk, & Mitruski (2006; Ryan & Peterson, 2004). In terms of much lesser offenses, it is nonsensical and oxymoronic to remove a student from a classroom who is, for example, refusing to work by either putting his head down on a desktop or sitting in a teacher's chair. Why would educators want to remove a student who refuses to work from the learning environment? Therefore, it should come as no surprise that schools who use exclusionary practices as the primary or sole form of discipline have lower student achievement test scores—primarily because of the loss of instructional time (Brown, 2007) than schools employing, for example, SWPBS (Scott & Barrett, 2004).

Dominant Paradigms and Their Effect on Intransigency

There is a common belief among educators that an increasing number of students are attending schools who display a wide range of behavior problems and mental health issues. The American Academy of Special Education Professionals indicated that 1 in 5 children and adults have been diagnosed with a mental disorder during the course of a year and high rates student disruptions are increasingly common in schools (Walker et al., 2004). Managing students' challenging behaviors has been one of the biggest concerns for both educators and the general public for over 10 years (American Educator, 1995-96; Elam, Rose, & Gallup, 1996). Nevertheless, dominant paradigms regarding schools and how they should react to students' behavior problems are very difficult to change because they represent ways to which institutions and individuals have become accustomed.

Are prevalence figures for students with the most challenging behaviors—those who do not respond to traditional forms of discipline—increasing? Within a SWPBS paradigm, students with challenging behaviors are the 5% who require tertiary intervention (Sugai & Horner, 2006). The 5% prevalence for students with emotional and behavioral disorders (EBD) has been amazingly consistent over the past 50 years from a large and diverse number of studies (Kauffman & Landrum, 2009). The prevalence of children with specific mental disorders varies more; although the prevalence of attention deficit hyperactivity disorder (5% - 10%) (Scahill & Schwab-Stone, 2000), conduct disorder (6%) (Kim-Cohen et al., 2005), and anxiety disorders (5%) (Fricchione, 2004) all hover around the 5% figure. The prevalence is less for obsessive-compulsive disorder (2% - 3%) (Zohar, 1999) and bipolar disorder (1%) (Moreno, Laje, Blanco, Jiang, Schmidt, & Olfson, 2007). Unipolar depression varies from a low of 2% for children up to 17% for adolescents (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003).

Although the 5% may be a stable prevalence, the point is that dominant paradigms educators hold regarding discipline do not apply for students with the most challenging behaviors. Yet, it is understandable why dominant paradigms die hard. For example, a teacher's traditional disciplinary techniques may work for 19 out of 20 students in the classroom. Therefore, the solution for the one student for whom it did not work is to do it more (Maag, 1999). The same example could apply for students who do not learn in a classroom. Imagine a teacher providing 20 students with reading instruction and 19 of them are learning well. What is the typical reaction of the teacher to the student who is failing to learn: ineffective instruction or ineffective learner? The latter is the more common belief because the teacher has "proof" that the instruction worked just fine for 19 out of 20 students. The same example could apply for discipline in the classroom. Given this backdrop, several beliefs

reflecting the dominant paradigm that interfere with overcoming limitations and their logical absurdity are described.

Students Need to be Treated the Same: It's Only Fair

How many times have teachers stated to students on the first day of the school year that it is a “clean slate” and that all students will be treated the same. The rationale is often to reassure students that a teacher will be fair and unbiased. No matter how well-intentioned, this statement is counterproductive for two reasons (Maag & Kemp, 2005). First, because humans are fallible, it is impossible for teachers to treat every student exactly the same way. According to the longitudinal research of Chess and Thomas (1984), effective parents not only treat their children differently but vary their interactions depending on the temperament of each child. Second, trying to treat all students the same makes it difficult to break out of the dominant paradigm and apply nonlinear, novel interventions that are necessary for students with the most challenging behaviors. Responding to students’ challenging behaviors requires educators to be flexible and unfettered by convention. Otherwise, teachers who try innovative techniques with one student run the risk of others complaining “That’s not fair.”

Maag and Kemp (2004) recommended that at the beginning of every new school year teachers tell students, “I’m going to treat each of you differently because I believe each of you have wonderfully diverse qualities” (p. 32). This statement acknowledges the inevitable—that teachers will treat students differently—and also sets the stage for using different approaches with different students. Therefore, when a student says, “It’s not fair that Billy gets to sit in the do-nothing chair” (see Maag 2001a), a teacher can respond by saying, “Don’t worry, I’ll come up with something just as unique for you when you’re having problems following directions.”

Some teachers are just as concerned about “fairness” as are students. These teachers often say that in order to be fair they must treat all students equally. But it is logically absurd to liken fairness to equality, as the following anecdote illustrates:

- Three people in pain enter the emergency room of a hospital. A man has a headache, a woman is experiencing labor pains, and a boy has pain from a broken ankle. The physician, wanting to be extremely fair, gives each person two aspirin and sends them all home (Maag & Kemp, 2004, p. 32).

Educators should embrace diversity in both students’ behaviors and their responses to them. Each student is a unique individual. Equity does not equal equality. Therefore, teachers should formulate their techniques to meet the uniqueness of each student’s needs rather than tailoring the student to fit any one technique (Zeig, 1985).

The Myth of Contagion

A common rationale for not wanting to treat some students differently is because then every student will be want to be treated differently. The core of this myth is “contagion”—a term used to describe how diseases spread. But it also has a figurative meaning of how harmful ideas are proliferated. For example, a common response from teachers who resist modifying an assignment for one student is “I can’t give Billy a math assignment with only 10 problems on it instead of 20 because then other students will notice and want their assignment to also only have 10 problems on it.” Consequently, the teacher gives Billy all 20 problems and he sits passively and refuses to complete any of them. The teacher’s response not to modify Billy’s assignment reveals a classic case of specious reasoning. Namely, if contagion occurs, then it should show no favorites—the contagion “pendulum” should swing both ways. Consequently, if the teacher was concerned that other students would see Billy get

an assignment with only 10 problems instead of 20, she likewise should be concerned the other students, upon seeing Billy complete no work would, in turn, not complete any of their work. It is absurd to think other students would not want to complete the assignment because of Billy's behavior. Yet, that is the error in reasoning put forth with the contagion argument.

An accommodation recommended by Reid (1999) for students with hyperactivity provides another example. Some teachers institute the very simply accommodation of giving a student with hyperactivity three desks: two on each side in the front of the room and one in the back in the middle. The rule is that the student can move from one of his desks to another without permission as long as it is done silently and without touching other students or their materials. Like in the previous example, many teachers would respond to the three-desk accommodation by saying "I can't give a student three desks because then everyone would want three desks." Consequently, the teacher resists making this accommodation and the student with hyperactivity is out of his seat walking around the classroom and disrupting others. But how many teachers would worry that other students, upon seeing the student with hyperactivity walking around the room would, in turn, get out their chairs to walk around? None. When asked why the other students would not walk around too, a common response is "because they don't have ADHD." In which case, they would not have wanted three desks.

It may, at first, appear puzzling why the teachers in the previous two examples would not at least try these very simple and time-efficient accommodations, let alone the illogical reasons given for not changing. Yet, contagion provides an easy "out." In reality, the phenomenon involved in the resistance may be the "back to zero" rule described previously. Giving a student three desks may be unusual, but it is not complicated. Rather, it is a very simple and effective accommodation (Reid, 1999). However, it sends teachers back to zero and forces them to view teaching differently than what they learned or came to believe. There is another common, yet spurious, reason for teachers being intransigent in their practices: The belief they are teaching some students a "lesson in life."

Lessons in Life Garnered from "Fairness"

Here is another common response from teachers when recommended to shorten an assignment or reduce the number of problems on it.

- "I understand what you're saying. But when is the student ever going to learn that not everybody in life is going to make accommodations for him? Sometimes, in life, we all have to do the same work as everybody else."

In this scenario, the teacher wants to teach the student a lesson. What lesson does the teacher want to teach? That not all people in life will make exceptions and sometimes the student will have to do what everyone else does. How will the teacher teach this lesson? By giving the student an assignment with the same number of problems on it as the other students. How much of this longer assignment is the student likely to complete? None or very little. Then what lesson did the student learn?

There is Not Enough Time to Make Accommodations for Every Student

Teaching is time-consuming. However, there is a large discrepancy between the time schools allocate for instruction, time teachers spent providing instruction, time students are engaged, and amount of students' academic responding. For example, Haynes and Jenkins (1986) found that only 44% of allocated time in a special education resource room was spent actively engaged in instruction. What happens to academic responding time? Howell and Nolet (2000) suggested that it is related to the types of decisions teachers make regarding the amount and kind of assignments. Several researchers have found that in some general and special education classes, students spent from 50% to 70% of allocated

time completing independent, paper-and-pencil, or non-teacher directed activities (Adams, 1990; Borg, 1980; Doyle & Carter, 1987; Muyskens & Ysseldyke, 1998). Hollowood, Salisbury, Rainforth, and Palombaro (1994) found that in some classes daily academic responding ranged from a low of 50% to a high of 90%.

It is a challenge for teachers to be more efficient with their instructional time given the pressure of preparing students to take high stakes tests mandated by No Child Left Behind (NCLB). Yell, Katsiyannis, and Shiner (2006) indicated that progress on these tests are mandated for all students, including subgroups of students identified in terms of disability, socioeconomic status, language background, race, and ethnicity. Consequently, teachers are teaching students how to take these tests as the expense of important aspects of the curriculum that are not receiving instruction. Not surprisingly, students have reported this overemphasis on high-stakes tests hinders their motivation, learning, and academic effort (Pope & Simon, 2005). Even using the optimistically high percentage of 90% student engagement per school day found by Hollowood et al. (1994) in some classes, teachers would still have a minimum of 36 additional minutes per day that could be devoted to making and implementing academic and behavioral accommodations for the few students who could benefit from them. The commonly held belief by teachers that there is no time for accommodations is just not support by research.

Students are Expected to Behave Well

Over 30 years ago, Howell (1978) described a major impediment to teachers dealing effectively with students' challenging behaviors being the concept of control—the belief that teachers' primary responsibility is to promote academic behavior through instruction and to control inappropriate behavior through punishment. Put another way, adults expect children to be good (i.e., ignore them) and react to them (i.e., punishment) when they are bad—a paradigm that continues to be well-accepted (Maag, 2004). Skinner (1971) believed society embraces punishment because it does not threaten their sense of freedom and dignity. People can choose to behave in a way to avoid punishment whereas reinforcement is incorrectly viewed as external coercion or bribery, thereby squelching internal motivation. Kohn's (1993) popular but misguided book, *Punished by Rewards*, reinforced this view. The adoption of many school districts' use of exclusionary discipline programs described previously reflects both these tenants.

This “control mentality” is as spurious an issue as those described previously, and just as easily dismissed. No teacher would ever approach a student who makes an academic mistake the same way as a student who makes a behavioral mistake. It would be difficult to imagine a teacher, upon seeing a student write down an incorrect answer for a division problem on a worksheet saying, “That’s totally inappropriate, go to the principal’s office, and there will be a conference with your parents. I will not tolerate that behavior in my classroom!” Rather, the teacher would provide corrective feedback. However, when it comes to a student making a social behavior mistake, a teacher’s common—and accepted—response is to remove him or her from the classroom. The dominant paradigm in this situation results in teachers being proactive to students’ academic behavior but reactive to their inappropriate social behavior. A little over two decades ago, Neel (1988) eruditely illustrated this point and its consequences:

- In a reading lesson, who schedules the time of instruction, selects the material, makes the presentation, looks for responses, and then provides correction? The teacher does. When a behavior problem occurs, who schedules it. Provides the materials, evaluates the response, and decides if the incident need to on? The students does. Who, then, is doing the learning? (p. 26)

Moving Beyond Intransigency: Impact of Professional Learning Communities

It is not easy breaking teachers out of the mindset for dealing more effectively with students with challenging behaviors. Barker (1992) coined this intransigency “paradigm paralysis”—a disorder of terminal certainty. A dominant paradigm is that behavior problems originate from students and in order for teachers to deal with them effectively, students must change their behaviors (Maag, 2001a). This perspective results in teachers repeatedly using the same unsuccessful tactics. However, a 180 degree different paradigm may be more unpalatable to teachers than students’ challenging behaviors. Namely, adult behaviors often elicit, contribute, or exacerbate students’ behavior problems. Another variable is that after repeated failures to change students’ challenging behaviors, teachers become frustrated, disheartened, and believe it is an impossible task (Landers, Alter, & Servilio, 2008). Clarke (1982) wrote in his seminal book, *Profiles of the Future*, that “it is really quite amazing by what margins competent but conservative scientists and engineers can miss the mark when they start with the preconceived idea that what they are investigating is impossible.” (p. 21).

It is difficult to change a dominant paradigm because it exists as unquestioned, tacit understanding (Barker, 1992). Nevertheless, Jackson (2009) believed that teachers can change and learn given the right mindset and practice. The professional learning community (PLC) may be a powerful approach for establishing paradigm pliancy—the opposite of paradigm paralysis.

Professional Learning Communities: Fact and Myth

Professional learning communities (PLCs) in the field of education were an outgrowth from the business sector regarding the capacity of organizations to learn. The idea was to develop collaborative positive and empowering work cultures for educators to improve student learning and behavior (Thompson, Gregg, & Niska, 2004). Vescio, Ross, and Adams (2008) indicted PLCs are based on two theoretical assumptions. First, knowledge resides in the everyday experiences of teachers and is effectively understood through critical reflection with others who share the same practical contexts. Second, regularly and repeatedly engaging teachers in PLCs will increase their professional knowledge and enhance student learning and behavior.

School reform efforts began to shift away from traditional one-shot workshops sometimes referred to as “spray and pray” because teachers are inundated (sprayed) with plethora of information over a short period of time and administrators hope (pray) they will use it to improve teaching and student learning. Researchers have found that teachers actively engaged in ongoing support, versus the traditional one-shot workshop, resulted in greater student outcomes (Saxe, Gearheart, & Nasir, 2001). In two recent reviews of the literature, Vescio et al. (2008) and Yoon, Duncan, Lee, Scarloss, and Shapley (2007) concluded that well-developed PLCs had a positive impact on teaching and student achievement.

The trend toward establishing PLCs is not an easy task. Newmann and Associates (1996) identified five essential characteristics of PLCs. First, schools need to develop shared values and norms regarding students’ ability to learn, how to deal with students’ challenging behaviors, and the proper roles of administrators, teachers, and parents. Second, there needs to be a clear and consistent focus on student learning and behavior. The issue here is not simply a focus on how students are taught but rather how they learn. Third, PLCs need to nurture and reinforce teachers’ use of reflective dialogue by establishing extensive and continuing conversations about curriculum, instruction, behavior management, and student learning. Fourth, a “deprivatizing” practice must be in place in order to make

teaching public. Teaching is not viewed as an individual endeavor that exists only within the four walls of a classroom but rather a shared process among teachers including their successes and challenges. Fifth, there needs to be a clear focus on collaboration—a byproduct of proper implementation of the other four characteristics.

It is common for educators to jump on the bandwagon of the latest fads—many of which are nothing more than a rehash of old unproven methods but capture attention because of glitzy packaging (Maag & Katsiyannis, 2003). This concern was raised by DuFour (2004) who was annoyed that all combinations of individuals with any interest in schools were calling themselves PLCs—from grade level teams to state departments of education. Simply framing work in terms of PLCs does not demonstrate that a learning community actually exists. DuFour also cautioned that the term “PLC” is in danger of losing all meaning when used in such a ubiquitous fashion. In order for PLCs to have any veracity, they must be sustained, job-embedded, collaborative, and have measurable outcomes of improved teaching practices and student learning (Darling-Hammond & Richardson, 2009; DuFour, 2004).

Paradigm Pliancy and PLCs

Paradigm pliancy involves the purposeful seeking out of new ways of improving teacher effectiveness and student learning. Learning communities represent a way to actively and continuously challenge existing paradigms by addressing this question: What do I believe is impossible to do in education but if it could be done would fundamentally improve teacher effectiveness and student learning? This task is not as easy as it may first appear. Darling-Hammond and Richardson (2009) pointed out how existing public school individualistic norms and school structures in the United States limit time for collaborative planning. Chung Wei, Andree, and Darling-Hammond (2009) examined educational practices of high achieving nations. They found that more than 85% of schools in Belgium, Denmark, Finland, Hungary, Ireland, Norway, Sweden, and Switzerland provided time each week for teachers’ professional collaboration. Furthermore, teachers in countries such as South Korea, Japan, and Singapore spend only about 35% of their time working in the classroom while the remainder is spent engaged in collaborative activities. In general, all these countries had the following common features:

- Time for professional leaning and collaboration built into teachers’ work hours
- Ongoing professional development activities embedded in teachers’ contexts and focused on the content to be taught
- Extensive opportunities for both formal and informal inservice development
- Supportive induction programs for new teachers
- School governance structures that involve teachers in decisions about curriculum, instruction, assessment, and professional development (ChungWei et al., 2009, p. 29).

Regrettably, structures for such elegant professional development and collaboration rarely exist in United States schools (Birman et al., 2007; Blank, de las Alas, & Smith, 2007). Instead the old paradigm of one-day workshops still prevails even though researchers have found greater effects when programs offered 30 to 100 hours of intense training spread out over 6 to 12 months (Yoon et al., 2007). The new PLC paradigm would require certain restructuring to allow for smaller school size, common planning time, lower staff complexity, and empowerment of teachers as decision makers (Louis, Marks, & Kruse, 1996). The fact that this information is now over 10 years old attests to the power of paradigm paralysis. Nevertheless, Grossman, Wineburg, and Woolworth (2001) found that although the process of shifting paradigm structures is typically sluggish and laden with confusion, conflict, and silence, it is possible to steadily work through these obstacles and build pathways for communities to develop.

Conclusion

We currently live in an era of paradigm shifts in many disciplines. Not every organization has the ability to formulate successful new paradigms. However, in the field of education, PLCs provide a supportive climate and structure for reducing resistance to change and improving teacher effectiveness and student learning. Toward the end of his book, Barker (1992) stated that “One person’s paradigm shift may be another person’s reality. Somewhere in the world, alternative paradigms are already part of a system” (p. 208). In the case of resistance to change, other high-achieving nations have provided the diagram and data for educational reform. All schools have to do is exert the courage to attain it.

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Preparing Students with Moderate/Severe Disabilities for Employment

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Introduction

Under United States federal law, all students are entitled to a free and appropriate education. What does this mean? With general education students the expectation in public schools is seemingly straight forward that they are preparing for college and the last four years of high school are spent meeting the graduation requirements. However, students who are in special education have a different scenario. They are guaranteed the right to attend school, but their education will vary depending upon their disability and their independent goals that are developed in a contract between the school and the parents called an Individual Educational Plan or IEP. Most moderate to severe students are destined to be on a “nonacademic” track, which means that they will not graduate with a diploma. They have the right to receive “educational services” until they are 21 and then at 22 they receive a “Certificate of Completion” for having met their IEP goals and are “aged out”; no longer qualifying for program services. Families move from a bureaucracy of “entitled services” to one of “eligibility”.

Students with moderate/severe disabilities are guaranteed within their IEP a section that is devoted to helping them to transition from entitlement to eligibility services. This section is called the Individual Transition Plan or ITP. Ideally, these students are working on life, social, and work skills that will help them to take care of themselves as independently as possible. However, for most people who are unfamiliar with this population there are questions:

- Why are we preparing students with moderate/severe disabilities for employment?
- What is the curricular sequence of preparation for employment?
- What are the common roadblocks?
- Are there any possible solutions?
- What are the ideal solutions?

This paper looks to answer these questions by looking at available research articles that have dealt with these issues in the past, as well as this author’s own past experiences working with the moderate/severely disabled in a Special Education Class for the past four years. The following is a report of those findings.

Key Factors/Research

According to an article found in the St. Louis Post-Dispatch entitled, Program Provides Work, Meaning for Disabled Students Transition, ‘Inclusion’ Offer Challenge to Many (Selbert, 1993), the author described a program that was unique in helping students with moderate/severe disabilities transition by including them in general education classes and job training three days a week. Inclusion in the general education classes allowed students the opportunities to learn such things as to interact with peers and

dressing appropriately. Working at some local businesses two times a week for a couple hours a day was the other part of the program. The goal of the program was to demonstrate that the students were “employable” upon graduation.

The article described one student, Monica, out of seven who was in this program and was severely retarded and blind. Her parents had moved all the way from Maryland just to participate in the program since they could not find any others like it at the time. The district finds employers who are willing to train the students and the district provides staff that supports the students. In Monica’s case she was found a job folding napkins in a local restaurant.

Although this article was inspiring, it pointed out that most students with moderate/severe disabilities who do not have advocates will most likely end up after high school working in a sheltered workshop. Finding work for students, even after they demonstrated the ability to perform a specific job, was a “challenge”. Finally, the article ended with a quote from the instructor that said, “Our role at Special Schools is to help them make the transition into adult life and be better prepared to live in the community.” Lacking from the article was any indication at quantifying the success of the program, or even explaining what adult life meant for the severely disabled upon graduation. No clear description was given regarding the relationship between the school program and the adult agency program that was mentioned as the students’ eventual destination.

In a second article entitled, Getting ready for a working future; system to return funds to work program for disabled (Neufeld, 2006), a similar program offering summer work opportunities to the moderate/severely disabled at East Baltimore High School was found that provided transition services for 13 students out of a total of 70. For 13 years the Youth Works Program, provided salaries for the students during the summer and in exchange the students picked up trash, cleaned up bathrooms and distributed lunches, milk and juice to preschool students. The school district paid the salaries of the supervisors. However, the school district decided to stop funding the supervisors’ positions and the parents and community complained.

During the interim of the dispute, parents stepped in to help provide supervision for the students’ jobs. According to the program’s operator, \$15,000 was needed to pay for four supervisors at two locations. The students worked 30 hours a week at \$6.15 per hour. Parents were frustrated that a program that demonstrated “success” was being shut down.

Success was described in one sense by the hiring of ten alumni of the summer program at the business’ linen, food service, and housekeeping departments. Another measurement of success was described by one teacher as observed improvement in their social skills and work habits. Improvement in self esteem and recognition in the value of earning money to purchase desired commodities was also cited.

One of the more comprehensive articles reviewed that was found in the International Labor Review entitled, Supported Employment: Equal opportunities for severely disabled men and women (Konig, 1991), provided many details and cited specific research and statistical data on program success in three different countries. In its look at the problems confronting employment for severely disabled, it recognized that many of the programs that were successful depended upon the following factors:

1. strong family involvement and advocacy
2. strong leadership
3. Good connections with university and other consultants
4. allocation of funds for start up costs.

Basically, in its review of programs in the United States, Italy and the United Kingdom, it found Italy's Genoa Program reported a 90% success rate in incorporating disabled individuals into the work force and keeping them there. What was remarkable about the program was that it focused on natural supports provided by the employers and family rather than professional support staff. The report also cited case studies that indicated the worse case scenario for most severely disabled people would be work in a sheltered work environment that provides below minimum wage work that is tedious and boring to the individuals. Emphasis was placed on providing the individuals with work that could provide them not just a menial routine, but also one in which they were included in a normal work place environment. As a result, changes in behaviors were documented and deemed as positive changes by the support staff.

The article reported that finding work environments for the disabled makes financial sense, because it lessens their dependence upon government help and reduces the financial burden their care places on taxpayers. It also implicated that meaningful work for the disabled can increase self esteem, reverse and change negative behavior patterns, and provide motivation to socialize with others. However, this research also pointed out the challenge of resource allocation and finding appropriate leadership.

Reflection

After reviewing the literature, it is clear that the main hurdles regarding training students with moderate/severe disabilities for employment are:

1. Resources
 - a. Financial
 - b. Opportunities for work
 - c. Personnel committed to working with this population
2. Leadership
3. A shift in paradigm and how society sees moderate/severe people in the work force
4. Stronger relationship and funding between the public school system and the Department of Rehabilitation to provide a seamless transition for the disabled

The fore mentioned hurdles need to be addressed in any future or present programs viability. Without such programs, a shift in paradigm is less likely to take place. Disabled individuals need to be in the mainstream of society if they are to have their challenges addressed, instead of being out of sight and out of the general populations mind.

Although there has been movement in including moderate and severe in the workplace over the past 20 years, there seems to be little evidence of cooperation and coordination between bureaucracies that have the same goal, such as to place and support students with moderate/severe disabilities.

More research and discussion is needed in addressing these challenges and in documenting the value of such existing programs. Just in doing the literature review for this paper, it was obvious that not much has been written on or researched about the benefits of such programs. Many of the articles reviewed here date back to the 1990's. A lack of financial resources and low pay obviously hinders the quality, viability or even the consideration of similar start up programs.

Consequences for not acting upon the recommendations and findings of these programs will continue to impact tax payers in the United States. Similar to the challenges in the California Prison System that we are presently experiencing here, we are paying millions of dollars to provide security, medical services, and food for individuals, that in many instances, isolates them and contributes to behaviors that are unhealthy and require excessive medication to sedate them and make them more manageable in group settings. According to the research, it suggests that integrating people with disabilities is not only financially practical in the long run, but more humane. Without programs that advocate for an improvement in the transition process from school to post school settings, disabled adults are more likely to be put away in group homes that support them to be more dependent than independent.

Personal Reflection

In my own personal experiences in working in a moderate/severe Special Day Class for the past four years at a high school, I have had a spectrum of realizations. When I first started out, I focused on academics and focused my class curriculum on helping the students to participate in the state assessments, however, I discovered that this was wasted in most part on students, because after being in the educational environment for 10 or 14 years, they had either developed to their maximum potential in reading, writing, and calculations, or the students were destined to transition on to a sheltered group home where they would be cared for.

I then focused on trying to meet the letter of the law and develop within the students their abilities to be as independent as possible. For example, students who could not talk would be given a dynavox, a technical device that enables electronic communication, to be able to communicate with, or students who were severely autistic would be given jobs to work and demonstrate their abilities to adapt to work routines. However, in both of these situations, I soon discovered that whatever I do in the class to help students to become more independent was wasted if there was no one on the end of the transition helping to support and maintain the skills and abilities of the students. The student with the dynavox was put into a group home that took care of him and did not utilize the technology. The student who was autistic and did not want to work was supported by his parents as being overly “stressed” and so he will not work and will remain on the support and care of his parents until they become sick or die.

Feeling frustrated and wondering about my own efficacy as a teacher, it finally took a colleague to point out to me that my work in the class did have a purpose and a positive outcome even though it may not be as ideal as I had originally wanted. She pointed out that what she had observed in my class was the wonderful outcome of students who could communicate in a variety of ways and felt comfortable in the class community we had created together. She observed that the students demonstrated appropriate behaviors and did not require medication. She told me that my goal, given the challenges of the lack of coordination/support with parents and outside agencies was to document and support the students while they were in the classroom. By caring for them and helping them to behave in a socially supported environment, I was helping them to be supported and transition into a life that did not require them to be medicated.

I still keep the bigger goals in mind and plan to try and develop coordination and support from the families and outside agencies involved, but I realize now that although I can necessarily change what happens to the students when they leave my program, I can document the changes and abilities of the students while they are in my program with the hope that others down the road will care to take notice of their potentials and humanity.

Resources

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Academic Interventions Implemented to Teach Students with Emotional Disturbance

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Need for Intervention

Behavioral and academic concerns

The concerns surrounding educating children with emotional disturbance are complex and multi-faceted. This is because the issues facing these children are compounded when students do not receive interventions at a young age; accordingly, their behaviors continue to deteriorate, thus becoming more intense and disruptive. In the end, this affects both their academic achievement and ability to function around others.

Resources, timing, and expertise

According to Eber, Sugai, Smith, & Scott (2002) meeting the challenges presented by these problems requires a significant amount of resources, time, and expertise, especially when the aim is to obtain behavioral and academic improvements. Furthermore, Duda, Michelle, Dunlap, Fox, Lentin, and Clarke (2004) express that timing is crucial, as studies show that the best results are achieved when these students are still in elementary school. To change their behavior and improve academic abilities, it is best to expose these children to highly structured behavioral intervention programs that use research-based academic, behavioral, and ecological interventions.

Purpose of the Study

Research Study

Possibility of improvements

Over the last several years, a vast amount of research has been conducted concerning children with behavioral and emotional difficulties. As stated previously by Duda et al. (2004) these students can make considerable behavioral and academic improvements if the proper interventions are implemented early. According to Eber et al. (2002) in order to make differences in the students' academic abilities and behavior, the interventions need to be positive, collaborative, culturally appropriate, sustained for the needed duration, and evaluated regularly.

Focus of study

The focus of this qualitative research study is the examination of academic interventions implemented by special education behavioral teachers, special education behavioral paraprofessionals, and general education teachers who work daily with students with emotional disturbance. "Which academic interventions did special education behavioral teachers, special education behavioral paraprofessionals, and general education teachers implement with students with emotional disturbance and which of these interventions were most effective in bringing forth improvements?" is the research question posed for this study. The premise of the study is that, if these interventions are indeed collaborative and

conducted early enough, students should be able to successfully participate behaviorally and academically in general education classrooms with support.

Academic Research Based Interventions

Comparison of Academic Progress of Students

Learning disabilities and emotional disturbance. A vital aspect to consider when analyzing the progress of these students is their academic achievement. This is because better-educated persons are more prepared to support themselves in the future. In a study conducted by Anderson, Kutash, and Duchnowski (2001), academic progress of students with emotional and behavioral disorders (EBD) was compared to the academic progress of students with learning disabilities over a five-year period. This study consisted of 42 students with emotional and behavioral difficulties and 61 students with learning disabilities. Achievement tests scores were evaluated for this study when the participants were in kindergarten or first grade and then again in fifth or sixth grades. Other factors, such as early retention, attendance records, time spent in special education classes, and behavior offenses were also taken into consideration in determining the results. This study found that students with emotional and behavioral disorders had higher achievement scores than students with learning disabilities when initially tested in kindergarten or first grade. However, by the second administration of achievement tests, students with learning disabilities had significantly higher scores than the students with EBD. These results occurred despite the fact that students with emotional and behavioral disorders received significantly more full-time services than the students with learning disabilities (Anderson et al., 2001).

Individualized Curricular Modifications

Definition

According to Kern, Delaney, Clarke, and Childs (2001), individualized curricular modifications are varying ways to complete academic tasks specified to meet the distinct needs of students. A teacher allowing a student to access a computer to type his or her spelling words instead of writing the words by hand is an example of individualized curricular modifications.

Problematic behaviors in academic tasks

Fortunately, there are techniques that can be utilized to improve academic instruction so that students with emotional and behavioral disorders can maximize their education and control undesirable behaviors. Students with emotional and behavioral difficulties (EBD) often exhibit problematic behaviors during academic tasks. A study conducted by Kern, Delaney, Clarke, and Childs (2001) hypothesized that certain individualized curricular modifications could assist students with EBD and help eliminate undesirable problematic behaviors during academic tasks. Students with emotional and behavioral disorders were then given various ways to complete academic tasks. For example, when given writing assignments, the boys had the opportunity to either handwrite the assignment or use a computer. The results of the study indicate that having the opportunity to self-select different transcribing methods actually decreased problematic behavior.

Verbal Reinforcements (Praise)

Definition

According to Sutherland, Wehby, and Yoder (2002), verbal reinforcement, also commonly referred to as praise, is positive or affirmative comments stated verbally to students when they demonstrated appropriate academic or behavioral tasks.

Praise by teachers and academic compliance

In a study conducted by Sutherland, Wehby, and Yoder (2002), it was hypothesized that students with emotional and behavioral disorders (EBD) performed better academically, and participated better, when praised by teachers. The study consisted of twenty self-contained classrooms for students with emotional and behavioral disorders. Each classroom was staffed with a full-time teacher and paraprofessional. The average number of students in each classroom was 10.8. Each teacher who participated in the study was observed for ten sessions, each lasting fifteen minutes. The observations occurred during times that the teachers participated in explicit, teacher-led academic instruction. The results indicate that students who were praised responded to academic tasks. Students who were not praised by their teachers were less likely to respond to academic requests. Praise was an essential and effective teaching method to promote students with EBD to respond to academic requests.

Dialogue Journals

Definition

According to Konold, Miller, and Konold (2004), dialogue journaling is an academic intervention in which frequent written correspondence between a student and teacher occurs. Many ways to implement the intervention of dialogue journaling exist. The most frequent type of implementation occurs when a teacher provides the student with a particular topic or question. The student responds to the topic or question by writing in a journal. The teacher then provides the student with a written response in the journal, generating communication.

Benefits

The researchers found that dialogue journals provide the students with positive attention and validation of their feelings and needs. They encourage less motivated students to write and provide teachers opportunity to model effective writing and social skills. The journaling process also allows students to express themselves and form relationships with adults.

Specialized Reading Programs

Definition

According to McLaughlin and Reid (2001), specialized reading programs are specifically designed to improve the decoding, comprehension, and fluency skills of students.

A multitude of specialized reading programs exist, ranging in complexity.

Specialized reading program study

McLaughlin and Reid (2001) conducted a study in which nine elementary students with behavioral disorders participated in a specialized reading program. The reading program contained fourteen workbook pages of programmed reading per day. The program was conducted in two different variations. In the first variation, the students were allowed to read and complete as many pages as they liked within one hour. The second variation included teacher participation, wherein the instructors paced the students on the 14 workbook pages, daily. Students not completing the teacher-paced variation reading assignment were required to stay after school until the assignment was completed.

Descriptions of participants

The participants in the study were male students who exhibited an array of disciplinary problems including verbal aggression, physical aggression, lying, truancy, and low academic interest. The students were 2.3 to 4.6 years behind in reading at the time of the study. The participants were

members of a self-contained classroom with special education services for students with behavioral and emotional difficulties.

Results of Study

On average, students completed one to two pages each day during the times of self-pacing. Teacher-paced instruction resulted in completion of the entire daily 14 workbook pages. This study provides important insight on a beneficial instructional method in assisting students with behavioral and emotional difficulties.

Quality Teacher Feedback

Definition

According to Reagan (2003), the academic intervention, quality teacher feedback occurs when teachers provide students with specific verbal or written comments to assist them in improving their understanding and comprehension of an academic objective.

Benefits

Reagan (2003) outlines how high quality feedback given by teachers can enhance the learning opportunities of students. The article confirms that verbal or written comments to students reinforce desirable behaviors, informs the student of their progress, and allows students to build upon learning opportunities. Feedback is especially beneficial for students with disabilities. In general, there are several types of feedback geared to maximize specific learning situations.

Types of quality teacher feedback

According to Reagan (2003), there are three various types of appropriate feedback for verbally answered questions. The first type is the three-termed contingency trial feedback, in which the teacher asks a question, the student answers, and the teacher informs the student if the answer is right or wrong. The second type is referred to as the differentiated feedback, in which teachers vary their feedback depending upon one of the four types of student responses. The third type is corrective feedback, wherein teachers add supplemental information to the student's response. During corrective feedback, teachers supply miscalled words during oral reading; this type of feedback enhances student comprehension, shapes reading skills, and improves student motivation. Finally, Reagan describes two appropriate feedback models for homework assignments - the elaborated feedback routine and the written feedback model. The former is implemented when the teacher provides detailed feedback upon completion of written assignments, while the latter requires teachers to provide both positive and corrective comments.

Direct Instruction and Mediated Learning

Definition of direct instruction

According to Mills, Cole, Jenkins, and Dale (2002), direct instruction is a method that involves direct, fast-paced, highly structured teaching.

Definition of mediated learning

According to Mills, Cole, Jenkins, and Dale (2002) the mediated learning model consists of students working together to solve problems. The students are encouraged to interact with each other and often times are allowed to select their own materials or activities.

Context of the Study

Location of Study

This study took place in a school district located in a city in West Texas. The three elementary schools that participated in this study all had the specialized behavioral classrooms. The selected schools were located in different areas within the city; each represented various socioeconomic demographics. This particular school district was selected as the setting for this research because it offered the unique behavioral special education classes, specially designed for students with emotional disturbance.

Data Sources

Special Education Behavioral Teacher Participants

Three varying groups of individuals were the participants in this study. The three special education behavioral teachers were automatically selected because they were the only eligible elementary specialized behavioral teachers in the school district. These teachers provided varying degrees of support to the students with emotional disturbance. The level of support depended greatly on the behavioral needs of the students. Some students demonstrated chronic, severe disruptive behaviors and remained in self-contained behavioral classrooms. In these situations, the special education behavioral teachers were responsible for teaching all academic subjects, as well as implementing behavioral techniques to improve the behaviors of the students. As the students exhibited behavioral improvements, they were gradually placed into general education classes. These teachers then closely monitored the students' behaviors and academic achievements.

Conversely, some students with emotional disturbance did not display chronic, disruptive behaviors. These students were behaviorally able to participate fully in general education classes. In these cases, the special education behavioral teachers monitored the students' behavioral and academic achievements. The special education behavioral teachers offered support to the general education teachers. However, the students were not in the self-contained behavioral classrooms. Other times, students with emotional disturbance remained in the self-contained behavioral classrooms for a portion of the school day, only later to attend general education classrooms; in these cases, both the special education behavioral teachers and general education teachers were responsible for teaching these students.

Special Education Behavioral Paraprofessional Participants

The second group - three paraprofessionals, worked daily with students with emotional disturbance. Each of the three special education behavioral teachers who participated in this study had two full time paraprofessionals working with them. However, only one paraprofessional per behavioral classroom was selected to participate in this study. The researcher used purposive sampling in this study in order to "increase the range of data exposed and maximize the researcher's ability to identify emerging themes and take adequate account of contextual conditions and cultural norms" (Erlandson, Harris, Skipper, & Allen, 1993, p.82). The researcher used purposive sampling so that she was able to select paraprofessionals to participate in the study with diverse ethnicities, ages, genders, and experience working in behavioral classrooms.

General Education Teacher Participants

General education teachers encompassed the third category of participants in this study. The researcher purposely selected a total of three general education teachers to participate in this study. The researcher

also used purposive sampling here, so as to select general education teachers with varying ages and experience. The researcher chose the general education teachers who, at the times of the interviews, taught students with emotional disturbance. In some instances, the general education teachers selected for this study were responsible for teaching the students all of his or her academic subjects. In other instances, the general education teachers spent only limited time with the students because the students' disruptive behaviors prevented them from inclusion in the general education setting.

Data Collection Methods

Interviews

The data for this study was collected using interviews. Each participant in the study was interviewed once for a total of nine interviews. The researcher met the participants individually in their classrooms during a time they preferred, anticipating that each interview would take approximately thirty minutes to conduct. However, this time varied greatly depending on the individual participant. The researcher also asked the participants' permission to tape record the interview; after each, the interviews were immediately transcribed. During the interviews, the researcher also wrote annotations on the participants' responses. After the interviews, she took copious and meticulous notes on the environment of the classrooms, including types of bulletin boards, the arrangement of desks, additional furniture, and teaching resources.

The nine participants in this study were asked questions concerning their implementation of the following researched-based academic interventions: (a) individualized curricular modifications, (b) praise by teachers, (c) dialogue journals, (d) specialized reading programs, (e) quality teacher feedback, (f) direct instruction, and (g) mediated learning. The participants were also asked to select the two academic interventions that in their professional opinions produced the most academic improvements in their students with emotional disturbance.

Data Analysis of Participants

Academic Interventions at a Glance

Do the Participants Implement These Specific Interventions?

	Behavioral A	Behavioral B	Behavioral C	Para. A	Para. B	Para. C	General A	General B	General C
Curricular Modifications	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Verbal Praise	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialogue Journals	No	Yes	No	No	Yes	No	Yes	No	No
Specialized Reading Programs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Quality Teacher Feedback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Direct Instruction	No	No	No	No	No	No	Yes	Yes	Yes

Mediated Learning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Discussions and Implications

The researcher conducted interviews with nine participants in this study concerning the implementation of a variety of researched-based academic interventions so that the research question, “Which academic interventions did special education behavioral teachers, special education behavioral paraprofessionals, and general education teachers implement with students with emotional disturbance and which of these interventions were most effective in bringing forth improvements?” could be thoroughly answered. In an attempt to answer this profound question, the researcher uncovered several themes of great interest.

Theme One - Implementation differences among participants

The researcher inquired of the participants if they put into practice a total of seven research-based academic intervention which included: (a) varying ways to complete academic tasks, (b) verbal praise, (c) dialogues journals, (d) specialized reading programs, (e) quality teacher feedback, (f) direct instruction, and (g) mediated learning. The information provided to the researcher indicated that special education behavioral teachers and special education behavioral paraprofessionals utilized slightly more of the academic interventions than did the general education teachers. Special Education Behavioral Teacher B and Paraprofessional B employed six interventions each. Three participants, Special Education Behavioral Teacher A, Special Education Teacher C, and Paraprofessional A all used five interventions. Conversely, Paraprofessional C implemented four academic interventions.

However, General Education Teacher A made use of all seven academic interventions with her student with emotional disturbance. Quite the opposite was true of General Education Teacher B and General Education Teacher C. General Education Teacher B only used three of the aforementioned academic interventions and when provided with the opportunity did not offer any additional academic interventions that she used. Whereas, General Education Teacher C put into practice four of the academic interventions, however she did mention one additional academic intervention during her interview, which was sending her student with emotional disturbance to receive academic assistance from the behavioral staff.

As the researcher stated earlier, the behavioral staff members used slightly more academic interventions than did the general education teachers. However, the difference between the numbers of academic interventions the behavioral staff members implemented and the number of academic interventions the general education teachers used was so slight, the researcher was reluctant to draw an unwavering conclusion.

Theme Two - Most effective academic interventions

A much more noteworthy theme erupted concerning the academic intervention selections of the three individual groups of participants. Each participant in this study was asked to choose two academic interventions, which in their experience had proven to be the most effective in teaching their students with emotional disturbance. One intervention in particular, verbal praise was preferred time and time again by eight of the nine participants. Verbal praise was selected more often than any other academic

intervention as being the most productive when teaching students with emotional disturbance. The widespread use of verbal praise was confirmation that verbal praise was undeniably an effective and successful intervention.

The second academic intervention that was selected most frequently by the nine participants was quality teacher feedback. According to Regan (2003), the intervention of quality teacher feedback was greatly beneficial to students with disabilities because it reinforced desired behaviors, informed the students of their progress, and built upon learning opportunities. All nine participants unanimously reported the utilization of only two academic interventions, verbal praise and quality teacher feedback. Three of the participants, Paraprofessional C, General Education Teacher B, and General Education C selected quality teacher feedback as one of the two most successful interventions in which they implemented while instructing their students with emotional disturbance. If all of the academic interventions were listed in order of the participants who proclaimed them to be most successful, praise would be number one and quality teacher feedback would have been ranked as number two.

Two participants selected varying ways to complete academic tasks as one of the two most effective academic interventions. Varying ways to complete academic tasks was chosen by Special Education Behavioral Teacher A and Paraprofessional B as one of the most successful interventions in which they implemented with their students with emotional disturbance. Though only two behavioral staff members deemed varying ways to complete academic tasks as most beneficial, five of the six behavioral staff members, excluding Paraprofessional C stated that they used this intervention numerous times a day to six times each week and commended this intervention highly.

Conversely, only one of the general education participants, General Education Teacher A expressed that she utilized this intervention. Both General Education Teacher B and General Education Teacher C were firm in their decisions not to utilize varying ways to complete academic tasks. General Education Teacher B and General Education Teacher C implied that their students had to complete assignments using the same mode as their other students unless specified as an accommodation.

The researcher found it interesting that two of the three general education teachers refused to implement this intervention by any means regardless of the possible benefits to their students with emotional disturbance. Studies by Kern et al. (2001) show that the employment of individualized curricular modifications resulted in decreased problematic behaviors and increased on task behaviors for students with emotional disturbance.

Mediated learning was not selected by any of the participants in this study as being the most effective academic intervention. However, eight of the nine participants, excluding General Education Teacher B put into practice this intervention with their students with emotional disturbance. The researcher thought that this was a noteworthy phenomenon and worthy of investigation. The researcher contended that although mediated learning was not deemed as the most effective intervention it was still extremely significant and vital in the teaching of students with emotional disturbance. The data supported this conclusion because of its widespread use across both behavioral and general education classrooms.

Theme Three - Assistance from behavioral staff

The final theme involved the most effective academic intervention selection of General Education Teacher A and General Education Teacher C. Both of these general education teachers expressed that the assistance their students with emotional disturbance received from behavioral staff members was most beneficial. Assistance from the behavioral staff was originally not included in the list of seven

academic interventions. However, both General Education Teacher A and General Education Teacher C offered this approach when the researcher inquired if the participants would like to discuss any other interventions they implemented with their students. General Education Teacher A explained in her interview that behavioral staff members came into her classroom and assisted their student with emotional disturbance. On the other hand, General Education Teacher C asked her student with emotional disturbance to go to the behavioral classroom to receive additional assistance with his assignments.

This theme demonstrated the collaboration and alliance between the general education teachers and behavioral staff members. These teachers had devised plans among themselves to best meet the needs of their students with emotional disturbance, whether it was the behavioral staff members actually going into the general education classroom or the student leaving the general education setting for a designated period of time so that he may go to the behavioral classroom to receive additional academic assistance. This phenomenon supported previous research conducted by Katz and Mirenda (2002) reiterating that students achieve greater academic success when teachers share their expertise, ideas, and worked together in a collaborative manner.

Summary of Answers

All students are different and have diverse academic needs. An intervention that demonstrates remarkable academic results with one student may not be as successful with others. It is important to note that the only academic intervention in this study that was deemed as most effective almost unanimously by the participants was verbal praise. However, the researcher contends that the readers of this study must not only take into consideration the interventions that were considered by the participants as most effective, but also those interventions that verified wide spread use by both the behavioral staff members and general education teachers alike. Three interventions in particular, quality teacher feedback, varying ways to complete academic tasks, and additional academic support from the behavioral staff all demonstrated tremendous importance in this study.

According to Eber et al. (2002), numerous academic interventions are required and teachers and paraprofessionals must tailor the interventions to their specific students. The readers of this study must not think that the use of one particular academic intervention will create extraordinary academic success for all students with emotional disturbance. The use of one academic intervention is simply not sufficient in meeting the needs of students with emotional disturbance. In order to teach students with emotional disturbance effectively and to the high level of excellence they deserve, special education behavioral teachers, behavioral paraprofessionals, and general education teachers must continually assess the academic needs of their students and revise their interventions as necessary.

Future Research

This research has opened pathways to two possible future studies.

Research Possibility One

This study could be replicated a number of times increasing the number of participants. Instead of utilizing nine participants, future studies could encompass more behavioral teachers, paraprofessionals,

and general education teachers with even more awareness in selecting participants of ethnic, age, and gender diversities.

Research Possibility Two

An in depth study involving students with emotional disturbance, as participants would also be particularly interesting. This future study proposal would consist of academic interventions being utilized with students with emotional disturbance and then a researcher charting their progress over a predetermined set period of time. With the implementation of documents and records, interviews, and observations the researcher would be able to compare the interventions that brought forth the greater amount of improvements and those interventions that yielded poor or unimpressive results.

Summary

In order for students with emotional disturbance to achieve maximum success, it is imperative that dedicated educators utilize numerous academic, behavioral, and ecological interventions. This study has provided necessary information concerning an assortment of academic interventions and their levels of effectiveness as perceived by educators who work with students with emotional disturbance daily. The key factor is that a combination of interventions must be implemented over a substantial period of time for true benefits to be achieved. Educators must continually evaluate the needs of their students and devise plans customized specifically to meet those needs. Determination and collaboration of all those involved with the students are also essential features in acquiring success.

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From LD to Degree: Effective Techniques for the Student with a Learning Disability

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Person with Multiple Learning Needs

Abstract

The purpose of this article is to espouse and highlight some essential ingredients for a student with learning disabilities and differences to survive outside of the K-12 setting. Many students with LD move to colleges and universities throughout the United States, and perhaps even the world. As they earn undergraduate and even graduate degrees, they are clearly using many techniques of self-support to complement their areas of need. This article will focus on the key skills that an LD students needs to thrive and be successful to go on to earn advanced degrees and certifications in very challenging fields. The perspective put forth in this article is one of a firsthand encounter. I, (Josh) the author of this piece can attest first hand to the challenges of going on to college, graduate school then enrolling in a Doctorate program. It is the goal to provide students and teachers alike with a general sketch of how to prepare students for college.

From LD to Degree: Effective techniques for the Student with a Learning Disability

The most critical part of long-term student success is teaching skills and techniques for learning that the student can implement on his or her own. Teachers, mentors and counselors must provide a student with unique learning needs with support and tools necessary to assist the student throughout his or her academic career. Some tools may include, but are certainly not limited to: teaching the use of a calendar book or an electronic organization device, if you were supporting someone with organizational issues. This electronic device could be a palm-pilot, a data phone (such as a blackberry with sync capability) or even just using a computer based calendar that provides reminders when necessary. It sounds simple but simply suggesting or providing such a device would be inadequate for the student. The teacher or mentor would need to come up with an organizational technique that works in each unique case, and help the student learn to use any one of these modalities.

There are so many tools that can be used to support the needs of unique learners, that this article would not in any way do such a discussion justice. However, the teacher or mentor must seek out and find tools the students can identify with and are comfortable with at that time. However, it is even more crucial for a teacher to teach a student how he or she learns, and what methodologies or pedagogies work the most effective for him or her. Students need to learn how to self-identify situations where learning will be challenging, and be able to select a tool or tools from their arsenal to use themselves without support.

As students go to college, there is less and less structured support in many cases. And thus the responsibility to advocate, communicate and organize is left up to the student. This shift in roles can take a toll on a student. When in college and being overwhelmed, it is often hard for one to understand what to do and how to do it, never mind how to learn and how the individual learns.

So, if it is important to identify tools and processes to help students help themselves, as well as teach students how they learn, how is this all done? The answer is not a simple one, where a simple prescription can be applied; however the things that have been successful over the journey of this author have been the following techniques:

- Take an interest in treatment and TEAM meetings.
- Ask questions and go over testing results with a qualified interpreter.
- Know what your specific test results mean by asking the interpreter or doing additional research.
- Understand your legal rights and accommodations guaranteed under the law.
- Ask for help when you are struggling...and when you find a technique that works—capitalize on it.
- Learn to understand your own processing ability and how research shows you to support it.

The above list is not all inclusive, but represents things that can be done even by a 15 or 16 year old. The responsibility to expose students to these things falls on the teacher or mentor. For once the students leave your case load or graduate from your school or program, they are going to have to help themselves. While most colleges and universities have programs for students with identified areas of need, the support is generally less than what was received in the K-12 system. Students need to know what to ask for and how to use it once they get it.

These methods spoken about are derived from the personal experience of the author, as a person with several learning disabilities, but also professional experience as a Special Education Teacher, holding a Masters Degree from a top-tier research university in Boston, MA, and holding a Professional Board Certification in Special Education. Each of these academic milestones required more and more self-advocacy and self-awareness of learning needs and styles. Then, going on to the current academic endeavor—earning an Ed.D., from the same top-tier university as the Masters Degree is an even larger and more current challenge; a challenge that no doubt will be met with unmatched diligence and success. But this success has been and will continue to be brought on by understanding one's own learning needs and effectively utilizing the appropriate tools to aid in learning. Mastery of this skill only comes with an understanding of the elements previously delineated as a base. Make no mistake, there is a lot more to a student's success in obtaining a college or university degree than what has been provided here, but this is a starting point that has proven effective several times over.

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Teaching Spelling to Singaporean Chinese Children with Dysorthographia in English Language: Lexical Versus Lexical Phonological Approach

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Abstract

Singaporean Chinese children diagnosed with dysorthographia in English language undergo an intensive spelling intervention program that teaches them to use either of the two spelling methods: lexical and/or phonological spelling strategies. Nevertheless, many of them continue to perform poorly in their spelling. A pretest-posttest experimental design was used to determine whether 20 children ages 9 to 10 years old diagnosed with dysorthographia who were taught both lexical and phonological spelling strategies would improve in spelling more than a matched control group of 20 children, also diagnosed with dysorthographia who were taught lexical spelling strategies alone. Both groups of children received five lessons per week over seven weeks. The results showed that while both groups improved in spelling performance significantly from pretest to posttest, the experimental group which was taught both lexical and phonological spelling strategies improved significantly more than the control group which was taught lexical spelling strategies alone.

Teaching Spelling to Singaporean Chinese Children with Dysorthographia in English Language: Lexical Versus Lexical Phonological Approach

What is dysorthographia?

The term dysorthographia begins with dys announces that the symptom, condition or state of being is dysfunctional or faulty. Orthography refers to correct or standard spelling in general (Richards, Platt, & Weber, 1985). When the dys is added to orthography, dysorthographia becomes a term referring to a specific learning disability (SLD) associated with poor performance in spelling (Pierangelo & Giuliani, 2006). It can be a developmental disorder which means it is of constitutional origin or it is an acquired disorder due to an external insult to the brain, characterized by a durable defect of assimilation of morphological and/or phonological rules resulting in the deterioration of the spontaneous written expression or under dictation. Bosse (2008) has identified a dysorthographic child as one who is unable to remember lexical spelling as a result of the core deficit in phonological processing. However, this

phonological processing deficit cannot fully explain why there are children, who are able to read words using an analytic procedure, still unable to memorize their spelling.

Studies (see Sterling & Robson, 1992) on children with SLD in spelling or dysorthographia (both terms are considered synonymous here and will be used interchangeably throughout this paper) have identified the following problems they encounter such as, slowness and poverty of written expression with lots of hesitations (Tay, 2005); committing linguistic errors relating to grammar, conjugation and spelling (Funnell, 1992); writing difficulties similar to those relating to dyslexia (see Bosse, 2008; Nicolson, Pickering, & Fawcett, 1992); errors in copying with arbitrary misspellings (Funnell, 1992; Sterling & Seed, 1992); and spelling errors due to additions, omissions, substitutions and reversals of letters and/or syllables (Chia, 1996).

Dysorthographia is neither an officially recognized term nor it is listed in either the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision (DSM-IV-TR) (American Psychiatric Association, 2000) or the International Statistical Classification of Diseases and Health Related Problems-Tenth Revision-Second Edition (ICD-10-2) (World Health Organization, 2004). However, the term can be found listed in the recently published Educator's Diagnostic Manual of Disabilities and Disorders (EDM) (Pierangelo & Giuliani, 2007) under the disability category of learning disabilities (see LD 5.00, p.31). This official manual of the American Academy of the Special Education Professionals has listed the following diagnostic symptoms of dysorthographia: "addition of unneeded letters, omission of needed letters, reversals of vowels, reversals of syllables, phonemic spelling of non-phonemic words, and/or difficulty in understanding the correspondence between sounds and letters" (p.31).

Very little research, if any, has been done and published on children identified and/or diagnosed to have SLD in spelling or dysorthographia. Besides, the term itself is not widely known or used in the literature of special education. Most of the time, such children severely poor in spelling are treated as dyslexic and are seldom or never grouped as dysorthographic to be intervened differently from others. In addition, the teaching of spelling is not at present either a fashionable or an exciting topic of discussion amongst educators and more so if they are special professionals. It involves various skills and is something that many children especially those learning English as a second language find difficult. Correct spelling of English words seems to involve both phonological and visual skills (Bradley, 1985). For both teachers and their students, spelling is probably most troublesome because the English language is so variable and so vast (Bromley, 1988). It becomes tougher for regular teachers (not to talk about the special professionals) if the students they are teaching have SLD in spelling or dysorthographia.

Problems in spelling of English words

Before examining the spelling process in detail, it is worth considering how children might spell highly familiar words like their own names, or highly irregular words like through, tough and rhythm. They may have the spellings of these words stored in their mental lexicon and can look them up when required. In fact, such a spelling mechanism based around a mental lexicon is vital if children are to spell irregular words at all (Jorm, 1983). Words with irregular spellings cannot be spelled purely by application of sound-to-print (i.e., phoneme-grapheme) conversion rules. In fact, there are many words that cannot be correctly spelled using such rules (Sterling & Robson, 1992). There are inevitably occasions when children have to spell a word for which they do not have complete information stored in their mental lexicon. As such, they may turn to the use of sound-to-print rules, or some related

mechanism, like spelling by analogy. However, the application of rules in English spelling is by no means a simple process.

One interesting thing to note about sound-to-print rules in English is that most sounds can be represented several different ways in print. For instance, the word cat could also be spelled phonetically as catt, katt or kat. If English words are to be spelled correctly using rules, there is a need for children to develop some method of selecting the appropriate letters to represent each sound. However, the problem with English is that the relationships between sounds and spellings are too often ambiguous or idiosyncratic (Sterling, 1992). Fortunately, in some cases the ambiguities are rule-governed. For instance, the spelling of /k/ is generally spelt with a “c” if it precedes “a”, “o” or “u” (e.g., cat, cot, cut) but with a “k” before “e” or “i” (e.g., keg, kit). In other cases, the spelling of a sound depends systematically on where in the word the sound occurs. For example, /ei/ is spelt “ay” at the end of words (e.g., day, stay) but as “ai” or “a-e” when it occurs in the middle (e.g., raid, fade). Unfortunately, in many cases there is no obvious rule or regularity that enables the speller to predict which alternative should be used. The most obvious examples of this ambiguity are those words called homophones, which have the same sound but different spellings (maid/made, been/bean). Finally, while alternative spellings such as “ea” and “ee” do at least have the merit of occurring in large numbers of words, the notoriety that English spelling has achieved is probably most attributable to the so-called exception word, the spelling of which is both unprincipled and infrequent (e.g., laugh, colonel) (Barry & Seymour, 1988).

There are some important constraints that can help children in selecting the correct letters to represent each sound in English spelling. For instance, the position of a sound in a word influences the way it is spelled or written. The word cat could not be spelled as ckat because “ck” never happens at the beginning of words. However, in the word tack, “ck” is a perfectly acceptable spelling for exactly the same sound. A second constraint on spelling is provided by the grammatical function of a word in a sentence. For example, dogs could be more appropriately spelled as dogz on phonetic grounds, but “s” is used to mark the plural or a noun in English spelling and “z” is not. Yet another constraint is provided by the historical origin of a word. Many English words are of Germanic, Roman, or Greek origin. A particular sound may be spelled differently depending on the historical origin of the word in which it occurs. For example, in words derived from Greek, /k/ is written as “ch” (e.g., chaos, cholera, psychology), while in words of Roman origin it is written as “c” (e.g., compose, concert, concord).

It can be seen that the print-to-sound (grapheme-phoneme) rules that can be applied in reading unfamiliar words are somewhat different in kind from the sound-to-print (phoneme-grapheme) rules of spelling; the speller often has to make a choice between several plausible spellings, whereas the reader does not encounter this problem to such a degree. This is one reason why a child with dysorthographia (SLD in spelling) faces problems that are different from those of another with dyslexia (SLD in reading). For instance, reading the word cat by print-to-sound rules is unambiguous because there is only one possible pronunciation. However, spelling the word cat is by no means so simple because the speller has several possible spellings to choose from (cat, catt, kat, katt), each of which is plausible on phonetic grounds. Hence, if spelling by rules is to be even marginally successful, children need to be able to use some extra process involving the selection of the most appropriate alternative. Jorm (1983) has referred to the constraints in English spelling, which have been discussed earlier, as “orthographic rules” that allow this selection to take place. Frith (1980) has used the term “orthographic stage” to describe the speller’s increasing experience or skill in using visual, semantic and syntactic representations in addition to phonology in their spelling. Hence, a child diagnosed with dysorthographia has obviously failed to attain the orthographic stage, which means he/she has

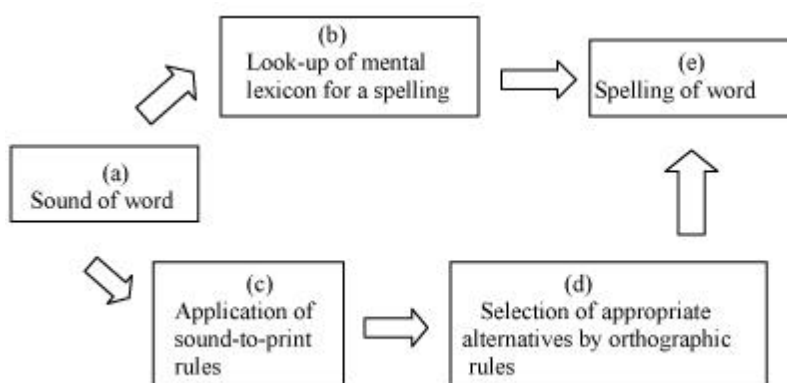
experiential or skill deficiency in utilizing visual, semantic, syntactic and phonological elements in the spelling process.

For teachers in both mainstream and special schools, the teaching of spelling, and hence, the development of their students' ability to spell accurately, is a day by day matter of concern that is considered important in school and in the eyes of the general public. In other words, education is often strongly associated with accurate literacy (Aranas, 1992; Chia, 2007; Taaffe, 1990) and all students must learn to spell accurately if they are to be orthographically literate.

Dual-route model of spelling

It is generally accepted that there are two central processes in spelling that skilled spellers can use (Ellis, 1984; Goulondris, 1992; Jorm, 1983). They can use a lexical process, in which the precise spelling of word is retrieved directly from the mental lexicon; and/or they can use a sub-lexical, or phonological (sound-to-print), process that is used primarily for assembling unfamiliar words in which words are broken into their constituent phonemic elements, and phoneme-grapheme rules used to generate a plausible spelling. This dual-route model of spelling has been summarized in the following diagram by Jorm (1983):

Figure 1:
Dual-route model of spelling (Jorm, 1983)



The diagram shows that when (a) a word is to be spelled, its spelling can be achieved by either (b) looking up in the mental lexicon to find out whether a spelling for the word is stored there, or (c) using the sound-to-print (phoneme-grapheme) rules to generate possible spellings and (d) selecting the most appropriate spelling from the options available using orthographic rules (Jorm, 1983). Finally, whichever route is taken, the result is (e) a spelling for the word. Though the diagram shows two separate routes, these routes are unlikely to be completely separate. Both routes may be followed in parallel and they may interact with each other (Jorm, 1983).

This dual-route model shows how a normal speller of English can produce both correct spellings of the many irregular words (e.g., colonel) and phonologically plausible spellings of non-words (e.g., ig, homseld). Irregular words could not be spelled correctly by any purely non-lexical sound-to-spelling conversion and so lexical knowledge is necessary. Non-words require some non- or at least sub-lexical sound-to-spelling conversion process because, by definition, they have no full representation in the

lexicon (Barry, 1992). In other words, the speller can turn to either of the two systems, lexical or phonological, whichever is most feasible at the moment of spelling need. While all known words can be spelled by a lexical route, if they have representations stored in the mental lexicon, low-frequency words may need to be spelled using the phonological systems as they may have only partial or non-existent representations in the mental lexicon.

Beginning and poor spellers as well as those diagnosed with dysorthographia frequently remember their spellings in much the same way as they remember pictures – perhaps partially, with only some distinctive components being remembered. They often use a lexical or visual/logographic strategy to spell: a known word stored in memory is retrieved and its mental representation is then written down. For an accurate spelling, both the identity and order of the letters have to be stored in memory (Funnell, 1992). The accuracy of a spelling also depends on how well the word is known (Sterling & Seed, 1992). Evidence for visual/logographic spelling in young children comes from Seymour (1992), Seymour and Elder (1986), and Seymour and Evans (1988), who reported that young children can often spell their names and certain words although they cannot spell phonologically. Peters (1985) has claimed that visual imagery may be the important factor in the learning and recall of word spellings. Another study (Price & Finkelstein, 1994) has shown that using appropriate pictures associated with the words apparently helped to improve young children's scores on spelling tests, although the major problem with this strategy is finding appropriate pictures for abstract words such as hope and faith. Nevertheless, Goulandris (1992) argued that a lexical strategy alone does not explain young children's ability to recall word spellings. New words are learned by referring to orthographic memory, in which recurrent spelling patterns are gradually abstracted by using basic sound-spelling mappings as a framework. At the moment, this author has not found any current research done on whether children with dysorthographia have a deficit orthographic memory and it would certainly be an interesting study. For this framework to be available, the child must have acquired at least rudimentary phonological skills. Goulandris (1992) has cited evidence from the research on invented spellings and stage-based error analyses (Huxford, Terrell, & Bradley, 1992; Mann, Tobin, & Wilson, 1987; Read, 1986).

Phonological versus lexical spelling strategies

Both phonological and lexical approaches may be used in spelling, but the debate is still going on as to the relative importance of each to good spelling. Whether the spelling strategies prove appropriate or inappropriate will depend upon how well adapted they are to the task (Taylor & Martlew, 1992). English spelling involves an accurate representation of its orthography which is described as consisting of two major systems (Pyles & Algeo, 1982). One system is comprised of words and morphemes, while the other contains phonemes. However, theorists disagree as to which system is fundamental to contemporary spelling structure. Read (1986) has argued that spelling represents phonemes rather than morphemes. However, Chomsky (1970) stated that spelling embodies abstract lexical meanings. Venezky's (1970) conclusion, that phonological, morphological and syntactical patterns all co-exist and interact synergetically within the orthography, offers a compromise between these opposing views.

Many children, who are identified as poor spellers, may not necessarily have dysorthographia, and they have become poor spellers because they do not use either a phonological or a lexical strategy appropriately during their spelling tasks (Taylor & Martlew, 1992). As a result, it is never easy to diagnose a child with dysorthographia as one has to consider the psycholinguistic factors in addition to the nosological factors that help to define and classify the SLD in spelling. Though some young children might have learnt the names of letters, many are not aware of the phonemes these letters

represent in a particular context (phonemes change according to context). Associating a letter with its name rather than with the phonemes it represents can actually hamper the acquisition of both reading and spelling skills. For example, the name of upper-case “A” as well as lower-case “a” is read as /ei/, but is pronounced differently as /ei/ in apron, /a:/ in father, and /ae/ in cat. Seymour (1992), and Seymour and Bunce (1992) have suggested the need for a speller to use both lexical and phonological processes, as the two systems form a dual-route process that encodes information about words and more general correspondences between the spoken words and their conventional graphic representations used in spelling. Ehri (1985) argued that accurate spellings are mastered when a learner is able to use both lexical and phonological strategies to fuse the visual and phonological representations of the word.

Statement of the problem

Singapore is a multi-cultural, multi-lingual country, where most children (non-native speakers of English) learn English as a second language in both mainstream and special schools. The teachers encounter many problems in teaching the spelling of English words. As students make many spelling mistakes, and the English language curriculum is often crowded with equally pressing demands for more reading and writing, the actual teaching of spelling is often confined to a short 15-minute session per week, at the beginning of a lesson. Under such circumstances, the teacher has to be very selective as to what he/she teaches. Quite naturally, many choose to teach only very simple distinctions as “minimal pairs” (e.g., pin/bin, meat/neat) in the hope that if the students can hear and make these minimal sound distinctions, they are on the road to successful spelling, as well as pronunciation (Tay, 1993). Other teachers, not confident about correcting misspelled English words, allow their students to spell freely with mistakes in the hope that so long as the students attempt to spell and combine a string of words into satisfactorily constructed meaningful sentences, they will “catch” the correct spelling in the end (Chan, 1993; Tay, 1993).

Formal spelling instruction in lower and middle primary levels is often done in two ways (provided the teachers are trained in phonics as not every teacher knows):

- (1) phonics is explicitly taught in the lower primary classes (P1 and P2) as a spelling, as well as a reading strategy; and
- (2) spelling rules are formally introduced and taught in the middle primary classes (P3 and P4).

Later, students in the upper primary classes (P5 and P6) are taught to correct misspellings, and grammatical and punctuation errors, but this is not the concern in the current study.

Despite going through this spelling instruction in school, there are still many students who do not spell well and who do not reach Frith’s (1985) orthographic stage of spelling development. This is particularly true of Singaporean Chinese students who are poor spellers of English words and who come from non-English speaking backgrounds. While it is necessary to examine the linguistic environments of Singaporean Chinese children as the first step to helping them improve their spelling skill in English, it is outside the scope of this paper and has been discussed elsewhere (see Chia, 1996). Another group of students is those who have been identified and diagnosed to have SLD in spelling or dysorthographia. Most of them have been originally assessed to have dyslexia before a further evaluation confirms them to be dysorthographic. Very often, these students continue to rely on non-orthographic memory mechanisms for recalling word spellings (Morton, 1987). Coming from non-

English speaking families, most Singaporean Chinese students, for instance, treat and spell English words as if they were Chinese characters through the use of whole-word or logographic strategies (Maideen, 1982; Toh, 1982).

If accurate spelling is to be the aim of the English language curriculum in Singapore's mainstream as well as special schools, teachers from both types of schools need to recognize the fact that it is misleading to assume that the main medium of pedagogical instruction is also the students' first or main language. Singaporean Chinese students are taught English as a medium of instruction and also learn Chinese (Mandarin is spoken Chinese) as their Mother Tongue, but they also speak various Chinese dialects (e.g., Cantonese, Hainanese, Hokkien, Shanghainese, and Teochew) and are not native speakers of Mandarin. This is because a Chinese child born in Singapore invariably falls into any one of the following categories (Chia, 1996; Lee, 1983): (i) a predominantly dialectic community; (ii) a predominantly Mandarin/English-speaking environment; (iii) a predominantly English-local dialectic environment; (iv) a predominantly English-Mandarin environment; or (v) other minor linguistic environments. Though Mandarin and the Chinese dialects may share the same logographic writing system, they differ in their phonological systems and this alone is enough to create difficulties when a child is learning to speak Mandarin. In addition to this, these Singaporean Chinese children have to learn English, whose phonological system differs from both Mandarin and Chinese dialects and whose orthographic system also differs from theirs. Thus, their problem in language learning increases further and more so for those students with dysorthographia.

Description of the study

Despite receiving the normal spelling instruction currently used in classrooms in Singapore (i.e., phonics and spelling rules), many Chinese students are unable to spell well in English. This becomes even more evident for those children diagnosed with dysorthographia. The purpose of this study was to investigate whether a combined strategy using a lexical (visual) and a phonological approach was more effective than a lexical approach alone in teaching spelling to children with dysorthographia. The phonological approach was designed to help children use the alphabet effectively, while in the lexical approach, children could use the visual strategies they have developed in the reading of Chinese characters.

Bradley (1985) has shown that for monolingual English children, both phonological and visual strategies are necessary for spelling proficiency. Nevertheless, it is possible that for Chinese Singaporean children, who are learning to read and spell in English and who have failed to spell well after spelling-sound rule instruction, phonological instruction may interfere with the visual strategies they have acquired in learning Chinese characters.

The phonological approach involved the following phoneme analysis tasks (Chia, 2003): sound-to-word matching, word-to-word matching, recognition of rhyme, phoneme isolation, phonemic segmentation, counting phonemes in a word, blending phonemes into a word, phoneme deletion, identifying missing phonemes, and phoneme substitution.

In the lexical approach, word shapes, concrete poems and storybooks with picture-word associations were used. A concrete poem is defined as a poem, usually of one word, without a line, rhyme, rhythm, stanza or even a title and in which the letters in its single word act out its meaning (Mueller & Reynolds, 1990; Yeo, 1986). For example, the word look can be written as l/k or another way as lô-ôk as if a pair of glasses has been put on. In other words, a concrete poem expresses the meaning through

the way the letters are drawn, arranged and sometimes, colored (Chia, 1991, 1993, 1994; Lim, 1994). In a concrete poem, the visual appearance of letters is very important. In this study, the following factors: the shape of each letter in a word, the size of each letter in the word, and the physical layout of all the letters in the word.

In this study, 40 Singaporean Chinese children were taught by either a lexical spelling strategy, or a combination of lexical and phonological spelling strategies. The aim of the study was to find out if children with dysorthographia demonstrated a significant increase in spelling performance after training in lexical (visual) spelling strategies, and also if children with dysorthographia demonstrated a significantly greater increase in spelling performance after training in lexical and phonological spelling strategies than those children who were trained in lexical spelling strategies only.

The Study

This is a pretest-posttest experimental design, in which children diagnosed with SLD in spelling or dysorthographia in the experimental and control groups were matched on spelling-related tasks, as measured at pretest. All children then received five lessons per week from Monday to Friday for seven weeks, either in spelling using lexical strategies (control) or in spelling using both lexical and phonological strategies (experimental). The dependent variable was the Schonell Graded Spelling Test (Schonell, 1955).

The purpose of this study was to determine whether (a) teaching lexical spelling strategies would increase the spelling scores of children diagnosed with dysorthographia, and (b) teaching phonological spelling strategies in addition to lexical spelling strategies would result in a greater increase in the spelling scores of children diagnosed with dysorthographia than the teaching of lexical spelling strategies alone.

Subjects

From 135 Singaporean Chinese children, aged between 9 and 10 years, diagnosed with SLD by psychologists and therapists within the last two to three years, using the Wechsler Intelligence Scale for Children, third edition or WISC-III (Wechsler, 1991) or fourth edition or WISC-IV (Wechsler, 2003), as well as various standardized reading and spelling tests such as the reading and spelling subtests from the British Ability Scales (Elliot, Murray, & Pearson, 1979) or the Wide Range Achievement Test-Third Edition (Wilkinson, 1993), a sample of 40 SLD children who displayed more severe problems in spelling than reading (also known as SLD in spelling or dysorthographia) was randomly selected (see Table 1).

Table 1:
Psycho-educational information of the 40 dyslexic children

Groups	Psycho-educational results (based on WISC-III/IV and standardized reading and spelling tests)	
Experimental group (N = 20)	Mean FSIQ = 119 Mean VIQ = 110 Mean PIQ = 126	Mean Chronological Age: 9:04 Mean Reading Age: 7:06 Mean Spelling Age: 6:01
Control group (N = 20)	Mean FSIQ = 121 Mean VIQ = 112 Mean PIQ = 128	Mean Chronological Age: 9:05 Mean Reading Age: 7:05 Mean Spelling Age: 6:03

In addition, the author of this study also used the diagnostic symptoms of dysorthographia specified under the Code LD 5.00 taken from the EDM (see Pierangelo & Giuliani, 2007, p.31) to confirm the psycho-educational diagnosis of the specific spelling disorder.

All the 40 children were attending intensive spelling programs at various learning clinics and remedial learning centers in different parts of Singapore. All of them are currently attending regular schools where English is the medium of instruction. Back in their respective primary schools, they are still being given additional help with English language by the learning support teachers and/or special needs officers.

The author administered the Schonell Graded Spelling Test, which is the seventh subtest of the Aston Index-Revised (Newton & Thomson, 1982), and six other spelling-related subtests chosen from the same assessment battery to the selected 40 children. Next, these children were systematically assigned to either the experimental group (Group A) or the control group (Group B) in the following manner: the first child on the ranking list was assigned Group A, the next on list to Group B and so on until two groups of 20 each were formed.

A formal consent to take part in the study from parents or guardians of each child was obtained. The information about the results of the Schonell Graded Spelling Test and the six spelling-related subtests selected from the Aston Index-Revised (Newton & Thomson, 1982) was shown to them.

Instrumentation

For this study, the Level 2 (for children who have begun their first year of primary education for at least six months) spelling-related subtests of the Aston Index-Revised (AI-R) (Newton & Thomson, 1982) were selected for psycho-educational test administration. The major purposes of the AI-R are to assist in the early identification of children who are at risk educationally and to suggest constructive interventions (Pumfrey, 1985; Vincent, Green, Francis, & Powney, 1983). Its usefulness as a screening device enables an examiner to assess an important range of skills such as the reading and spelling skills necessary for literacy (Newton, Thomson, & Richards, 1978).

The AI-R (Newton & Thomson, 1982) is divided into two areas, each of which provides different sorts of information concerning the child. The first measures general underlying ability and attainment, and one subtest – the Schonell Graded Spelling Test – was chosen. The second measures the performance and six subtests – visual discrimination, visual sequential memory (pictorial), auditory sequential memory, sound blending, visual sequential memory (symbolic), and sound discrimination – were chosen for use. All these seven subtests were selected because they are designed to focus attention on aspects of the children's skills important for their spelling (Quin & Macauslan, 1988). The seven subtests are briefly described below:

Subtest 7: Schonell Graded Spelling Test

An examinee is required to spell a number of words graded for difficulty to obtain a raw score that can be used to calculate his/her spelling age using the following formula:

$$\text{Spelling Age (SA)} = (\text{Number of words correctly spelled} \div 10) + 5$$

The examinee has to write each word given to him/her orally by the examiner and testing is discontinued when 10 consecutive words are spelled incorrectly.

Subtest 8: Visual Discrimination

An examinee is required to match 10 pairs of letters and words to determine his/her ability to discriminate visually similar letters or words, only one of which is exactly the same as each original. This subtest can help to reveal the examinee's letter knowledge, particularly in letter recognition and identification.

Subtest 12: Visual Sequential Memory (Pictorial)

An examinee is required to arrange a series of pictures to match an array presented by the examiner. The examinee's array should match an item order and left-right orientation of each picture. This is to test the examinee's visual sequential memory which is essential for his/her correct and accurate letter-sequencing in spelling words when the Look-Cover-Write-Check spelling routine is used.

Subtest 13: Auditory Sequential Memory

An examinee is required to repeat a series of digits from memory. The subtest is useful in determining ability to sequence letter-sounds of a given word correctly, as he/she spells the word from what he/she has heard being spoken.

Subtest 14: Sound Blending

An examinee is required to blend orally, sets of sounds presented by the examiner. This subtest is used to determine the examinee's ability to blend the discrete consonants and vowels together to spell a word phonetically.

Subtest 15: Visual Sequential Memory (Symbolic)

An examinee is required to arrange a series of symbols, which also includes letters from the English alphabet, in the correct order to match a series which has been presented by the examiner. This appears to make similar demands on the examiner as subtest 12 but its purpose is to determine the examinee's ability to arrange the symbols or letters correctly according to the correct shapes shown.

Subtest 16: Sound Discrimination

An examinee is required to repeat and to distinguish between similar sounds. This subtest is used to find out if the examinee is able to differentiate and match sounds.

Each subtest lasted about between five and 15 minutes was administered to all 40 children. The reliability of this instrument is determined by internal consistency measures, with the nine subtest reliabilities in the range of .90 to .98 (Newton & Thomson, 1982; Pumfrey, 1985). The standard errors of measurement are not provided. The degree of correlation among the nine subtests is in the range of .27 ($p=0.05$) to .64 ($p=0.001$) (Newton & Thomson, 1982).

The Teaching Program

- **Spelling Strategies**

1. Lexical spelling strategies/approach

This approach focused on spellings stored in orthographic memory and it was taught to the children in both experimental and control groups. If a word has to be spelled, the mental representation of the spelling is retrieved from memory and written down. For an accurate spelling, both the identity and order of the letters have to be stored in memory. All the tasks involved in this approach were as follows:

- (1) Word-picture association or matching activities

- (2) Creating concrete poems through the assembling of correct letter-shapes

- (3) Tracing letters of words in the air or in a tray of sand

- (4) Reading books and story handouts with selected picture-word associations
- (5) Making conventional word-shapes according to the entire word, or according to the phonemes, or according to individual letters
- (6) Using plastic letters (uppercase and lowercase) of the English alphabet to form words
- (7) Using the spelling routine as follows: Look-Cover-Write-Check
- (8) Eidetic imaging: A printed word is held before a child to see before it is removed, and he/she attempts to continue to “see” it while writing and spelling it in the space in which he/she “sees” it. The child copies the word from “space” onto the top of a sheet of paper. When this is done correctly, the paper is folded to conceal the first effort and it is written again from memory and then once more after folding and covering the second effort (Manzo & Manzo, 1993).

2. Phonological spelling strategies/approach

This approach was taught to the children in the experimental group in addition to the lexical spelling strategies. It focuses on the analysis and synthesis of sounds in words. The following tasks (see Appendix 3 for an expanded example) were used in this approach (see Chia, 2003):

- (1) Sound-to-word matching: e.g., does fish start with /f/?
- (2) Word-word matching: e.g., does fish start with the same sound as fat?
- (3) Recognition of rhyme: e.g., does fish rhyme with dish?
- (4) Isolation of a initial/medial/final phoneme: e.g., what is the first sound of fish? What is the middle sound of fish? What is the final sound of fish?
- (5) Phonemic segmentation: e.g., what are the three sounds in fish?
- (6) Counting the phonemes: e.g., tap on the desk as many times as there are sounds in the word fish
- (7) Phonemic blending: e.g., what word is made up of /f/, /i/ and /sh/?
- (8) Phonemic deletion: e.g., say fish; now say it without the sound /fi/;
- (9) Identifying missing phoneme: e.g., say man; now say an; what sound has been left out?
- (10) Phonemic substitution: e.g., say fish; now say it with /d/ instead of /f/
- (11) The spelling routine as follows: Look-Say-&-Listen-Feel-Cover-Write-Check.

A phonological spelling strategy was also applied to the words used in the concrete poetry to teach the children in the experimental group through the color phonics, which consists of color plastic letters of

lower case. For instance, blue was used to represent the initial consonant, red was used to represent the vowel, and green was used to represent the final consonant. Here is an example how the specialist teachers used the plastic letters (see Table 2):

1. The teacher stuck three letters of blue, red and green on the whiteboard to make the word **c a t** for all the children in the group to see.
2. The teacher read each sound of the letter and then the whole word *cat*. The children were encouraged to read along with her.
3. The teacher replaced the initial consonant **c** with other letters such as, **b**, **f**, **p**, and **m**.
4. The children read the new words formed as a result of the change of the initial consonant.
5. The teacher replaced the middle sound or vowel **a**, with other letters, **o** and **u**, for instance.
6. The children read the new words formed as a result of the change of the vowel.
7. The teacher replaced the final consonant with **p** and/or **b**.
8. The children read the new words formed as a result of the change of the final consonant.

Table 2:

Color phonics chart

BLUE	RED	GREEN
Initial consonant	Vowel	Final consonant
c	a	t
b		
f	o	p
p		
m	u	b

• **Materials**

1. *Scheme of lessons*

The scheme consists of 35 lessons that were taught every weekday for seven weeks. It provides the specialist teachers with guidelines about the types of activities to be done with the children in their respective groups. In the scheme of lessons, activities described in normal print involved the lexical strategy and were carried out in both the experimental and the control groups (i.e., Group A and Group B). Words printed in italics describe the phonological activities that were carried out in the experimental group only. The scheme also lists the handouts and the worksheets to be given to the children. The duration of each lesson was 40 minutes (excluding the initial five minutes used for attendance taking).

2. *Handouts/Supplementary handouts/Worksheets*

There were 34 handouts, 3 supplementary handouts and 128 worksheets which were developed for use for both phonological and lexical strategies, and they covered the various tasks that were discussed earlier. The children in the combined treatment (experimental) group were given handouts and worksheets covering both spelling strategies, while those in the lexical group only had handouts and worksheets covering the lexical strategy.

3. *Spelling tests/Mini-spelling tests*

Twelve spelling tests, 12 oral mini-spelling tests or exercises and 23 written mini-spelling tests were administered to the children in both the experimental and control groups throughout the seven weeks. The words used in these spelling tests and exercises were those already taught to the children in the lessons. The oral mini-spelling tests were given to the children in form of a game. For children in the experimental group, the specialist teacher used the following spelling routine: Look-Say-&-Listen-Feel-Cover-Write-Check, whereas the other specialist teacher teaching the control group used the following spelling routine: Look-Cover-Write-Check.

4. *Storybooks*

Several storybooks were selected from three different reading schemes in which each book uses pictures as substitutes for some words. These selected reading schemes were the Read Along With Me series (Tanner, 1987), Let's Learn to Read series (West, 1988), and Landoll's Key Words series (Landoll, 1993). Selected words, either common or proper nouns in each book are replaced by pictures. The storybooks were used by the teachers to show meaningful associations between the words and their respective pictures or symbols. These pictures depict some of the characters and objects in the story. As the specialist teachers read the storybook to their respective groups of children, they would pause whenever they came to a picture, and point to the picture for the children to see and say aloud. In addition to the reading schemes, picture-word association stories taken from two children's periodicals, i.e., D'Light and Ladybug, were photocopied with written permission from the respective publishers and distributed to the children as handouts for their reading with their specialist teacher in class only, after they had done their worksheets.

5. *Spelling games*

Five different games were selected for this study. These games were meant for the children to play only after they had completed worksheets given by their respective specialist teachers. The children in the control group were given two types of spelling games to play: Word-Picture Matching cards and Word-Picture Puzzle cards. For those in the experimental group, in addition to the two spelling games already mentioned, there were three other games involving phonics: Make-a-Word Bingo, Phonics flash cards, and Three-Letter Words cards. These three games involved children performing tasks such as, phonemic segmentation, blending, isolation of phonemes, and counting the phonemes.

6. *Whiteboards and markers*

The specialist teachers in both groups used their whiteboards during lessons. Colored markers were used in the color phonics approach to differentiate the initial consonants from the final consonants as well as vowels from consonants taught to the experimental group.

7. *Overhead projectors and transparencies*

These teaching tools were also provided to the two specialist teachers for use during their lessons when they flashed their overhead transparencies.

The Training Procedure

- **Specialist Teachers**
Two qualified specialist teachers with Diploma in Special Education (DISE) awarded by the National Institute of Education/Nanyang Technological University, Singapore, were selected for this study. Both had five years of teaching experience each. They had also undergone a three-month in-service course on teaching spelling at a private language training center in 2006. They were briefed in a three-hour session about this research study and the procedure for the seven-week program. Both were told that they would be teaching half the lessons with the experimental group and a half with the control group.
- **Format of Lesson**
See Table 3 below.

Table 3:
Format of a daily lesson taught over seven weeks

Duration	Activities	Group A (Experimental)	Group B (Control)
5 minutes	Marking attendance and checking if all the children were present.	ST (I)	ST (II)
5 minutes	Introduction to the lesson: usually began with a rhyme or two, a short-story telling, a song to sing, a short dialogue or role-play.	ST (I)	ST (II)
10 minutes	Tasks involving phonological strategies Tasks involving lexical strategies	ST (I)	ST (II)
5 minutes	Spelling games involving phonological strategies. Spelling games involving lexical strategies.	ST (I)	ST (II)
10 minutes	Tasks involving lexical strategies. Extension of spelling games involving lexical strategies.	ST (II)	ST (I)
5 minutes	Spelling games involving lexical strategies. Extension of spelling games involving lexical strategies.	ST (II)	ST (I)
5 minutes	Spelling test/Mini-spelling test or exercise (oral/written)	ST (II)	ST (I)
Total time spent: 40 minutes	Note: ST = Specialist Teacher	Specialist Teacher (I): 20 minutes with Group A and 20 minutes with Group B	

		Specialist Teacher (II): 20 minutes with Group B and 20 minutes with Group A <i>(Excluding the first 5 minutes spent on marking attendance.)</i>
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- **Experimental and Control Groups**

The children with dysorthographia in both the experimental and control groups were taught to spell English words through lexical spelling strategies that were taught during each 40-minute lesson. Word shapes and concrete poems were taught in the lexical spelling strategy. The main reasons for teaching word shapes and concrete poetry were that these could help to:

1. Increase their visual awareness of shape, size and physical layout of letters that form a meaningful word (Browne, 1994; Tang, 1994; Yeo, 1986)
2. Express the meaning of a word through the shape, size and physical layout of its letters (Mueller & Reynolds, 1990)
3. Enhance memory for word shapes so as to enable children to spell better (Browne, 1994)
4. Provide a channel for the children to express themselves creatively (Chia, 1991, 1993, 1994; Walshe, 1986).

Since the visual appearance of letters was very important here, the specialist teachers teaching concrete poetry in the lessons using the lexical spelling strategy had to keep in mind the following factors:

1. The shape of each letter in a given word
2. The size of each letter in the word
3. The physical layout of all the letters in forming the word.

In addition to the lexical spelling strategies, the children with dysorthographia in the experimental group were also taught spelling through a phonological approach using the phonological analysis (awareness) training methods. The following principles were strictly observed by the specialist teachers during their lessons in this approach (Aaron, 1989; Chia, 2003):

- 1. Phoneme analysis requires a very slow “stretched” pronunciation of the word to be segmented
- 2. All the tasks were firstly auditorily presented, and only after these tasks were mastered, were letters and words visually presented
- 3. In auditory tasks, children with dysorthographia were taught first to analyze short words into phonemes, and later to blend phonemes into syllables and words

4. Plosive consonants such as /b/, /d/, /g/, /p/, /t/ and /k/ were introduced first, while voiced and fricative consonants were introduced later
5. Analysis of words with two phoneme segments was mastered before segmental analysis of three phonemes was presented
6. Vowel-consonant syllables were taught before consonant-vowel syllables were introduced
7. Decoding of simple words was introduced after these skills were mastered.

Once these children with dysorthographia had completed their worksheets, they could choose their storybooks with picture-word associations to read or spelling games to play in class. Before the end of term in December 2008, the AI-R (Newton & Thomson, 1982) subtests were then administered as the posttest to all of them.

• Lesson Format

At the beginning of each lesson, five minutes was spent on taking attendance to check if all the children with dysorthographia were present for lesson by the two specialist teachers in their respective groups. This was followed by the next 40 minutes of teacher instruction. Both specialist teachers wrote and planned their lessons according to the scheme of lessons given to them by the LDcenter.

First 20 minutes:

(a) Group A (Experimental): Specialist Teacher (I)

As explained earlier in the section on spelling strategies, the emphasis was on phonological tasks relating to the analysis and synthesis of sounds in words:

1. Sound-to-word matching
2. Word-to-word matching
3. Rhyme recognition
4. Phonemic isolation
5. Phonemic segmentation
6. Phoneme count
7. Phonemic blending
8. Phoneme deletion
9. Identification of missing phoneme
10. Phonemic substitution
11. Spelling routine: Look-Say-&-Listen-Feel-Cover-Write-Check.

In each lesson, at least five phonological tasks out of the 11 were carried out in a rotational manner as follows:

Lesson 1: (1), (2), (3), (4) and (5)

Lesson 2: (6), (7), (8), (9) and (10)

Lesson 3: (11), (1), (2), (3) and (4) ... so on

(b) Group B (Control): Specialist Teacher (II)

The emphasis was on tasks related to word formation in terms of letter shape done by tracing, concrete poetry or eidetic imaging, word-picture association through matching activities or reading story books or story handouts with selected picture-word association, and the spelling routine: Look-Cover-Write-Check.

Second 20 minutes:

(a) Group A (Experimental): Teacher (II)

There was an exchange of the two specialist teachers. Specialist Teacher (II) moved to Group A, and taught the same content that was already taught in Group B.

(b) Group B (Control): Teacher (I)

Teacher (I) moved to Group B. Her role was to extend the application of lexical spelling strategies into spelling games and quizzes, spelling tests/exercises and reading story books with picture-word association.

Results & Discussion

The two research questions of concern in this study are as follows:

(1) Did children with dysorthographia demonstrate a significant increase in spelling performance after training in lexical (visual) spelling strategies?

(2) Did children with dysorthographia demonstrate a significantly greater increase in spelling performance after training in lexical and phonological spelling strategies than those children who were trained in lexical spelling strategies only?

In this section, the results for the two research questions are presented.

Means and standard deviations for all tasks (that is, the Schonell Graded Spelling Test and the six spelling-related subtests used in the pretest and posttest analyses) are given in Appendix 1. The measures as a whole are normally distributed with wide variability, except for the visual discrimination task in which a ceiling effect was obtained: all children in the experimental group scored the maximum of 10 marks at posttest.

Schonell Graded Spelling Test

The mean raw scores for the Schonell Graded Spelling test for the experimental group at pretest was 19.5 (SD = 7.16) and at posttest it was 30.8 (SD = 8.08); and for the control group at pretest it was 18.7 (SD = 7.14) and at posttest it was 24.45 (SD = 7.5). When converted to standardized scores, the mean spelling age for the experimental group was 6.95 years at pretest which increased to 8.08 years at posttest and the mean spelling age for the control group was 6.87 years at pretest which increased to 7.45 years at posttest. The chronological ages of the two groups were between 9 years 2 months and 9 years 10 months. It must be noted that the spelling ages were based on the British norms set for the Schonell Graded Spelling Test. The children in both the experimental and control groups showed an improvement in their spelling performance over the seven weeks of the intensive spelling program.

A t-test was carried out on the pretest scores of the Schonell Graded Spelling Test to confirm that the groups which were matched on this variable were indeed not significantly different in spelling ability. The results indicated that there was no significant difference between the groups, $t(38) = 0.34$, $p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved in spelling between pretest and posttest, a 2 (time: pretest, posttest) x

2 (group: experimental, control) analysis of variance was carried out on the scores of the Schonell Graded Spelling Test. The results, which are shown in Appendix 1 and Appendix 2, indicated that there was no significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 1626.88$, $p < .001$, and there was also a significant interaction, $F(1, 38) = 174.48$, $p < .001$. These results show that whilst both groups improved in spelling performance, the experimental group improved more than the control group. In other words, children with dysorthographia who were taught to use lexical and phonological spelling strategies had improved significantly more than those who were taught to use lexical spelling strategies alone.

Spelling-related Subtests

- **Visual Discrimination**

The means and standard deviations for the experimental and control groups on the visual discrimination tasks are shown in Appendix 1. The mean scores of the experimental and the control groups at pretest were 9.7 (SD = 0.64) and 9.45 (SD = 0.97) respectively. Their mean scores increased to 10.0 (SD = 0) for Group A and 9.75 (SD = 0.54) for Group B at posttest.

A t-test was carried out on the pretest scores of the spelling-related subtest of visual discrimination to confirm that the groups which were matched on this variable were indeed not significantly different in visual discrimination ability. The results indicated that there was no significant difference between the groups, $t(38) = 0.935$, $p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved in visual discrimination between pretest and posttest, a 2 (time: pretest, posttest) $\times$ 2 (group: experimental, control) analysis of variance was carried out on the scores of the spelling-related subtest of visual discrimination. The results, which are shown in Appendix 1 and Appendix 2, indicated that there was no significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 7.43$, $p < .01$, but there was no significant interaction, $F(1, 38) = 0.00$, $p = 1.0$. These results are limited by the fact that the data were not normally distributed in view of the ceiling effects at posttest for the experimental group. However, it would be expected that there would be no significant interaction on visual variables as both groups were trained in visual strategies.

- **Visual Sequential Memory (Pictorial)**

The means and standard deviations for the experimental and control groups on the task involving visual sequential memory (pictorial) are presented Appendix 1. The mean score of the experimental group increased from 12.7 (SD = 1.1) at pretest to 13.7 (SD = 1.23) at posttest, and the mean score of the control group increased from 12.55 (SD = 1.07) at pretest to 13.2 (SD = 1.21) at posttest.

A t-test was carried out on the pretest scores of the spelling-related subtest of visual sequential memory (pictorial) to confirm that the groups which were matched on this variable were indeed not significantly different in visual sequential memory (pictorial). The results indicated that there was no significant difference between the groups, $t(38) = 0.426$, $p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved in visual sequential memory (pictorial) between pretest and posttest, a 2 (time: pretest, posttest) x 2 (group: experimental, control) analysis of variance was carried out on the scores of the spelling-related subtest of visual sequential memory (pictorial). The variance was carried out on the scores of the spelling-related subtest of visual sequential memory (pictorial). The results, which are shown in Appendix 1 and Appendix 2, indicated that there was no significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 62.51, p < .001$, but there was no significant interaction, $F(1, 38) = 2.81, p = .10$. In other words, while both experimental and control groups showed improvement in performing the visual sequential memory (pictorial) tasks from pretest to posttest, the resultant performance of the experimental group was not significantly better than that of the control.

• **Visual Sequential Memory (Symbolic)**

The means and standard deviations for the experimental and control groups on the task involving visual sequential memory (symbolic) are presented in Appendix 1. The mean score of the experimental group increased from 13.4 (SD = 1.24) at pretest to 14.5 (SD = 1.07) at posttest, and the mean score of the control group increased from 13.2 (SD = 1.44) at pretest to 13.6 (SD = 1.28) at posttest.

A t-test was carried out on the pretest scores of the spelling-related subtest of visual sequential memory (symbolic) to confirm that the groups which were matched on this variable were indeed not significantly different. The results indicated that there was no significant difference between the groups, $t(38) = 0.459, p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved between pretest and posttest, a 2 (time: pretest, posttest) x 2 (group: experimental, control) analysis of variance was carried out on the scores of the spelling-related subtest of visual sequential memory (symbolic). The results, which are shown in Appendix 1 and Appendix 2 indicated that there was no significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 44.0, p < .001$, and there was also a significant interaction, $F(1, 38) = 7.74, p = .008$. These results show that whilst both groups improved in their performance in visual sequential memory (symbolic), the experimental group improved more than the control group. In other words, the score of the experimental group, which was taught spelling using lexical and phonological spelling strategies, in the task involving visual sequential memory (symbolic) was significantly better than the control group, which was taught to spell using lexical spelling strategies only.

• **Auditory Sequential Memory**

The means and the standard deviations for the experimental and control groups on the task involving auditory sequential memory are shown in Appendix 1. The mean score of the experimental group increased from 11.85 (SD = 0.96) at pretest to 13.2 (SD = 0.96) at posttest,

and the mean score of the control group increased from 11.75 (SD = 0.77) at pretest to 12.4 (SD = 0.92) at posttest.

A t-test was carried out on the pretest scores of the spelling-related subtest of auditory sequential memory to confirm that the groups which were matched on this variable were indeed not significantly different in auditory sequential memory. The results indicated that there was no significant difference between the groups, $t(38) = 0.354$, $p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved in their performance on auditory sequential memory between pretest and posttest, a 2 (time: pretest, posttest) x 2 (group: experimental, control) analysis of variance was carried out on the scores of the spelling-related subtest of auditory sequential memory. The results, which are shown in Appendix 1 and Appendix 2, indicated that there was no significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 134.4$, $p < .001$, and there was also a significant interaction, $F(1, 38) = 14.93$, $p < .001$. These results show that whilst both groups improved in their performance in auditory sequential memory, the experimental group improved more than the control group. In other words, the experimental group taught to spell using lexical and phonological spelling strategies performed significantly better than the control group taught to spell using lexical spelling strategies alone.

- Sound Discrimination

The means and standard deviations for the experimental and control groups on the task involving sound discrimination are shown in Appendix 1. The mean score of the experimental group increased from 17.4 (SD = 1.99) at pretest to 18.8 (SD = 1.64) at posttest, and the mean score of the control group increased from 17.2 (SD = 2.25) at pretest to 17.9 (SD = 2.07) at posttest.

A t-test was carried out on the pretest scores of the spelling-related subtest of sound discrimination to confirm that the groups which were matched on this variable were indeed not significantly different in sound discrimination. The results indicated that there was no significant difference between the groups, $t(38) = 0.291$, $p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved in their performance on sound discrimination between pretest and posttest, a 2 (time: pretest, posttest) x 2 (group: experimental, control) analysis of variance was carried out on the scores of the spelling-related subtest of sound discrimination. The results, which are shown in Appendix 1 and Appendix 2, indicated that there was no significant difference between the groups. However, there was a significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 85.17$, $p < .001$, and there was also a significant interaction, $F(1, 38) = 8.56$, $p = .006$. These results show that whilst both groups improved in their performance in sound discrimination, the experimental group improved more than the control group. In other words, the experimental group taught to spell using lexical and phonological spelling strategies

performed significantly better in the sound discrimination task than the control group taught to spell using lexical spelling strategies only.

• **Sound Blending**

The means and standard deviations for the experimental and control groups on the sound blending task are shown on Appendix 1. The mean score of the experimental group increased from 13.25 (SD = 1.67) at pretest to 14.4 (SD = 1.36) at posttest, and the mean score of the control increased from 13.05 (SD = 1.66) at pretest to 13.4 (SD = 1.50).

A t-test was carried out on the pretest scores of the spelling-related subtest of sound blending to confirm that the groups which were matched on this variable were indeed not significantly different in sound blending. The results indicated that there was no significant difference between the groups, $t(38) = 0.371$, $p > .05$.

In order to investigate whether there was a difference between the experimental and control groups and whether these children improved in their performance on the sound blending task between pretest and posttest, a 2 (time: pretest, posttest) x 2 (group: experimental, control) analysis of variance was carried out on the scores of the spelling-related subtest of sound blending. The results, which are shown in Appendix 1 and Appendix 2, indicated that there was no significant difference between the groups. However, there was a significant difference between the pretest and posttest scores, $F(1, 38) = 77.03$, $p < .001$, and there was also a significant interaction, $F(1, 38) = 21.91$, $p < .001$. These results show that whilst both groups improved in their performance on sound blending, the experimental group improved more than the control group. In other words, the experimental group children, who were taught to use lexical and phonological spelling strategies in spelling of English words, displayed a better performance in the sound blending task than those in the control group, who were taught to use lexical spelling strategies only.

Summary

The ANOVA results showed that there was a significant improvement in the spelling performance of children with dysorthographia after they had been taught to use lexical spelling strategies. Further. The experimental group which was taught to use a combination of lexical and phonological spelling strategies showed significantly more improvement than the control group which was taught to use lexical strategies only. The results also suggested that the performance of the experimental group was better than that of the control group in the auditory-based tasks of auditory sequential memory, sound discrimination and sound blending. The experimental group did not improve more than the control group on the visual tasks of discrimination and sequential memory (pictorial) but showed a greater improvement on the visual sequential memory (symbolic) task.

Conclusion

The main purpose of this study was to investigate whether training children diagnosed with dysorthographia to spell using lexical spelling strategies in a combination with phonological spelling

strategies would make them more effective spellers than if they were taught to spell using lexical spelling strategies alone. The study extends the findings of previous research because the linguistic background of Chinese children born in Singapore is very different from the background of most children hitherto reported in the literature. The majority of studies in this area have been carried out in western countries, in monolingual contexts where the writing systems are alphabetic (either totally or partially phonological). Singapore is different from most other countries in that Singaporean Chinese are exposed to an alphabetic script as well as a logographic script.

Findings of the study showed that the spelling performance of the experimental group children displayed significantly more improvement after training in both lexical and phonological spelling strategies than that of the control group children who were taught to spell using lexical strategies alone. In fact, within a period of seven weeks of intensive spelling instruction, the experimental group children improved their mean spelling age by 1.13 years from 6.95 years to 8.08 years, whereas the control group children improved their mean spelling age by 0.58 years from 6.87 years to 7.45 years. Thus, over the seven weeks of the study, the mean spelling age of the experimental group improved six months more than that of the control group. Nevertheless, it must be noted that both groups did improve significantly, suggesting that the lexical spelling strategies taught to both groups were to some extent effective. What is important about this study is that the teaching of a combination of lexical and phonological spelling strategies was even more effective than the teaching of lexical spelling strategies alone.

From the teaching perspective, the results of the study are very gratifying. With the exception of the scores from the subtests of visual discrimination and visual sequential memory (pictorial), the teaching of both lexical and phonological spelling strategies led to increased competence in spelling as well as in several spelling-related tasks. It would be expected that the experimental group would not show a superior performance on visual variables as both groups were trained in lexical (visual) strategies. The results showed that for visual discrimination and visual sequential memory (pictorial), there was indeed no significant interaction in favor of the experimental group. However, there was a significant interaction for visual sequential memory (symbolic). One reason to explain this phenomenon is that the task involving visual sequential memory (symbolic) uses letters, whereas pictures are used in the visual sequential memory (pictorial) task. Most likely, the experimental group children who became better spellers would have been better able to sequence letters from memory than the control group. Remembering letters in sequence is required for effective spelling. Furthermore, the experimental group's training in phonological awareness might have helped them to use letter sounds in combination with their shapes to help them remember letter sequences better than the control group.

It would also be expected that there would be a significant interaction in favor of the experimental group for the auditory variables, as the experimental group children were trained in phonological spelling strategies which could well have improved auditory skills such as auditory sequential memory, sound discrimination and sound blending.

The findings reported in this study show that the experimental group children, who were trained to use phonological spelling strategies to apply spelling-to-sound rules efficiently, made more progress in spelling than those control group children. Hence, the findings are consistent with Barron's study (1980) that shows a phonological spelling strategy is related to a fast application of spelling-to-sound rules involving the assembly of constituent phonemes to generate a plausible spelling of an unfamiliar word (Jorm, 1983). The lexical spelling strategies, on the other hand, are related to a slow application of spelling-to-sound rules because the precise spelling of a word is retrieved directly from the mental lexicon (Jorm, 1983). In other words, the experimental group children who were taught both spelling

strategies had an additional route to use in their spelling, and it appeared that the phonological spelling strategy had given them an extra edge to become better spellers.

The fact that a combination of lexical (visual) and phonological spelling strategies was more effective than lexical spelling strategies alone supports the work of Ehri (1985), which shows that learning to spell involves both orthographic and phonological knowledge. This will be elaborated further later on. The study also supports the work of Bradley (1985) who has shown that children need to use a combination of visual and phonological spelling strategies to read and spell well. When they do not connect these strategies in reading and spelling, development in both areas is slow.

Further, the results of the present study also support the results of research which has focused on the role of phonological awareness in the spelling acquisition of monolingual speakers of English. Rohl and Tunmer (1988) found that the poor spellers in their study had particular problems with phonological awareness. Rohl and Pratt (1995) found that phonological awareness was highly related to spelling, even when the effects of verbal working memory were controlled. The results are also consistent with research by Castle, Riach and Nicholson (1994). In their study, young children, who received training in phonological awareness in addition to their class writing program, were better able to spell words than a control group who did not receive this training.

No studies on instruction in phonological awareness has taken place in Singapore with children diagnosed with dysorthographia (or specific learning disability in spelling), but there are at least a few studies done with Chinese speaking children. One such study was carried out by Ho (1993). She showed that Singaporean Chinese children in Primary 4, who were good readers and spellers, were effective users of both phonological and visual strategies. Thus, her results agree with the findings of the current study. The present study also supports the findings of another research study carried out by Read, Zhang, Nie, and Ding (1986) with a group of Chinese students. They took advantage of the fact that some of these Chinese students had been taught only the traditional Chinese orthography (i.e., xiangxin wenzhi), which is logographic, while others had, in addition, been taught a Romanized version of written Chinese, called hanyu pinyin (i.e., the phoneticization of the Chinese script). The two groups were compared on phoneme deletion and addition tasks. Results showed that on both tasks the hanyu pinyin group performed significantly better than those who had learnt the xiangxin wenzhi. In other words, phonological learners of Chinese script performed better than logographic learners.

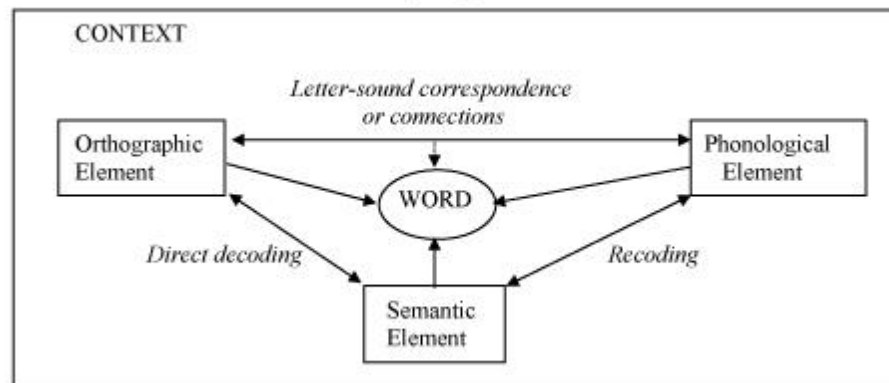
Why the experimental group did better in spelling

The study has demonstrated that under controlled equal time constraints, two different methods of teaching produced differences in spelling scores. The experimental group children taught to use lexical and phonological spelling strategies improved their spelling age six months more than those in the control group taught to use lexical spelling strategies alone. There are several possible explanations of these results.

One explanation why the experimental group children performed better than those in the control group could be that they could recognize words by remembering how they looked (visually) and were pronounced (phonologically) and/or spelled (orthographically). That is, the experimental group children could use both lexical and phonological spelling processes to form a dual-route process that encodes information about words and general correspondences between the spoken words and their conventional graphic representations used in spelling (Seymour, 1992; Seymour & Bunce, 1992). Thus the sight of a familiar target word triggers that word in memory, including information about its

spelling (orthographic element), pronunciation (phonological element) and meaning (semantic element) (see Figure 2).

Figure 2:
Components of a word and processes involved in word recognition for reading and spelling



An adequate account of this procedure must explain how these children with dysorthographia were able to look at specific printed words they had read and/or spelled before, and immediately locate their pronunciations and meanings in memory while by-passing thousands of other words, including those with similar spellings or meanings (Ehri, 1992). Moreover, an adequate explanation must cover how these children with dysorthographia were able to store and remember new words (Ehri, 1980; Reitsma, 1983). The kind of process thought to be at the heart of spelling is a connection-forming process (Ehri, 1995). Connections are formed that link the written forms of words to their pronunciations and meanings. This information is stored in the word memory bank or mental lexicon of each child.

Glushko (1981) suggests that when children store printed words in memory, they store the orthographic and phonological representations together. Then when they encounter new printed words containing letter sequences like those in familiar printed words, they activate phonological information stored with the orthographic information. This probably explains why the experimental group children in the current study performed better than those in the control group.

In the present study, the children with dysorthographia in both experimental and control groups were, of course, poor spellers of English words. Their learning to spell probably began as a non-alphabetic process involving memory for connections between selected visual cues and words. However, once the experimental group children had acquired more knowledge about the phonological system in the course of intensive training, learning to spell most likely changed into an alphabetic process involving connections between letters in written words and sounds in their pronunciation. In fact, they outperformed the other control group children, who might have been still very much at a logographic stage in their spelling, especially for unfamiliar and non-phonetic spellings (e.g., ice, little, write, light). It is hypothesized that at first, letter-sound (grapheme-phoneme) connections were partial, linking the most salient letters to sounds. When the experimental group children had acquired a better knowledge of the phonological system, complete connections could be formed between graphemes in spellings and phonemes in the pronunciations of words. As these children with dysorthographia became able to store

words in memory in fully analyzed forms, letter patterns recurring in different words could become consolidated into multi-letter units symbolizing phonological blends (e.g., /k/, /a/, /t/ blended to form cat; /sh/, /i/, /p/ blended to form ship). Letter-sound connections linking the letters in spellings to their pronunciations enable these children to represent thousands of words uniquely in their mental lexicons and to locate the pronunciations and meanings of these words accurately and automatically upon seeing them in print or learning to spell them (Ehri, 1987, 1992; Perfetti, 1992).

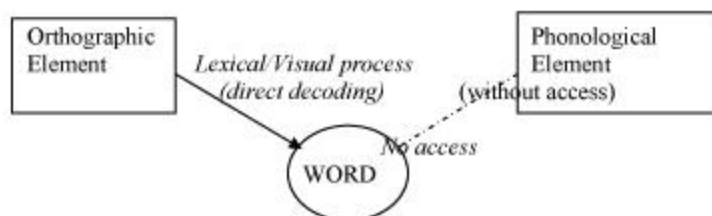
Another explanation for the superior spelling performance of the experimental group may lie in the fact that the children with dysorthographia in the control group were taught to spell English words using only lexical spelling strategies. The lexical approach to spelling requires these children to learn to recognize individual words as holistic units. As more and more words were added to the control group children's "sight words" vocabularies, they apparently became better spellers. However, the drawback of relying on lexical spelling strategies alone is that these children would be unable to decode or spell new English words without the specialist teacher to help them. If the control group children really learned to spell each new English word as a holistic unit, without any further analysis of its orthographic pattern, then it would be as though they were learning to spell Chinese words or characters. It was shown earlier that Chinese children have to learn a different kanji character (or xiangxin wenzhi) for every Chinese word, and their spelling performance in Chinese is consequently limited. It takes a long time to learn many patterns. Hence, the effectiveness of a lexical spelling strategy is limited by the fact that the mental lexicon has its own limitation in the storage of words. The retrieval of a word from the mental lexicon depends on whether it can be found in memory. For an accurate spelling, both the identity and order of the letters have to be stored in memory (Funnell, 1992). The accuracy of a spelling also depends on how well the word is known (Sterling & Seed, 1992) and visual imagery of words is also an important factor (Peters, 1985). Thus, the improvement of the control group's spelling may be more apparent than real. It is possible that further development in spelling for this group would be severely limited without some instruction in phonological spelling strategies.

On the other hand, the experimental group children learnt to spell using lexical and phonological spelling strategies which would have helped them to use the alphabetic principle underlying the spelling of English words, thus enabling them to generate the pronunciation of new words on the basis of words that they already knew. They might also have been able to use analogies which Goswami and Bryant (1990) have shown to be very important in learning to read and spell. For example, if they had a good representation of the word *fight* in their mental lexicon, they would have found the word *night* easy to learn if they were able to make the connection between the two words.

A third explanation of the superior performance of the experimental group may be found in the phonological recoding process which plays an important role in spelling. Jorm and Share (1983) noted that such a skill in making use of systematic relationships between letters and sounds gives children a strategy for processing unknown words and thus a way to acquire new words independently. Vandervelden and Siegel (1995), in their study, suggested the importance of phonological recoding in early literacy as a complex of skills in using systematic relationships between letters and sounds to recognize or to pronounce (i.e., retrieve the verbal labels of) unknown printed strings (words or pseudo-words) or to spell.

In this study, children with dysorthographia who spelled English words the logographic way used only lexical (visual) spelling strategies as a direct pathway to spelling. They have only the route of direct decoding to access the orthographic forms of words they want to spell (see Figure 3).

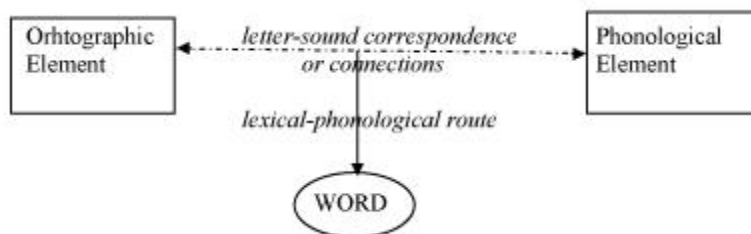
Figure 3:
Lexical/Visual process as a direct decoding process in word recognition for spelling (without access through the phonological route)



This route involves the direct retrieval of the precise spelling of a word from the mental lexicon on the condition that the word can be found in memory. Also, if the wrong spelling of the word were stored, the child would spell the word wrongly until the misspelling was corrected. It will thus be seen that if the control group children used only the lexical spelling strategies they were taught, their access to the correct spelling forms of words would be very limited.

However, the experimental group children, who were taught phonological strategies in addition to lexical strategies, have two more possible routes to access the spelling of words. Firstly, they could use a combination of lexical and phonological routes (see Figure 4) to ascertain the spelling of words and use either a lexical process or a phonological process to counter-check their spelling accuracy in terms of the identity and order of the letters (Funnell, 1992). In her amalgamation theory, Ehri (1978, 1980, 1984) explained early literacy learning as the adding of orthographic information for word spellings to known phonological and semantic/grammatical information. Once the orthographic form of a word has been stored in memory, a direct, visual/lexical pathway to associated semantic, grammatical and phonological information for that word becomes established.

Figure 4:
Lexical-phonological route using orthographic and phonological elements in word recognition for spelling



Secondly, should they be still unsure of the orthographic form of a word, these experimental group children who were taught phonological spelling strategies could use phonological recoding as a further route to access spellings (see Figure 5). A component skill of phonological recoding is phonological

awareness, that is, the ability to recognize, segment and blend sounds in spoken language (Vandervelden & Siegel, 1995). Hence, it can be seen that the experimental group children would have had more routes available to them when accessing spellings of words from memory.

Figure 5:
Phonological recoding in word recognition for spelling (without using direct decoding, that is, lexical/visual processes)



Limitations of the study

In this study all possible care was taken to control for extraneous variables. Children diagnosed with SLD in spelling or dysorthographia were carefully assigned to two groups (experimental and control) on the basis of a standardized spelling test and t-tests showed no significant difference between the two groups at pretest. Controls were made for possible specialist teacher effects by ensuring that both specialist teachers taught both groups for an equal amount of time. The training program was carefully controlled to ensure that both groups received the same lexically-based program for the same amount of time and that both groups received the amount of overall instruction in spelling. Nevertheless, it is possible that the improvement of the control group could have been due to the extra time spent in spelling activities, rather than to the lexical spelling strategies taught. It is also possible that the teaching of phonological spelling strategies alone could have led to a similar increase in spelling performance to that shown by the experimental group.

In order to have controlled for such variables, it would have been necessary to have included two more groups of children: one which was given the same amount of additional spelling instruction as the experimental group using regular class spelling instruction only; and another group which was taught phonological spelling strategies only. However, the inclusion of two more instructional groups would have been beyond the scope of this study. Further, it is unlikely that two more groups of Singaporean Chinese children diagnosed with dysorthographia could have been easily located.

Implications for the teaching of spelling

The findings of this study have interesting implications for the teaching of spelling to children with SLD in spelling or dysorthographia in Singapore or elsewhere.

In this study, experimental group children taught to spell English words using phonological spelling strategies in addition to lexical spelling strategies performed better than their counterparts in the control group who were taught to spell using lexical spelling strategies alone. This is most likely because there is a strong connection between children's awareness of the constituent sounds in words and their

success in learning to spell. The experimental group children, who developed an awareness of sound patterns, learned to spell better than those in the control group, who were not taught phonological awareness. This suggests that good phonological skills should be promoted among children diagnosed with SLD in spelling or dysorthographia, thus helping them to spell better through a phonological approach in addition to a lexical approach. Therefore, to improve the performance of such children in general, the method of instruction should aim to increase awareness of sounds, so that the phonological route can be made accessible. With the availability of this additional route, improvement in the performance of these children in their spelling of English words should follow.

However, it is important to note that the experimental group children, who were taught phonological spelling strategies, did not necessarily spell by working out the constituent sounds of words. Some of them may still have recognized words as visual patterns, without paying much attention to the individual letters or the sounds that they represent. What is important is that these children have two routes – lexical and phonological – available for spelling and they can choose whether to use one of these routes, or a combination of both.

Closing Conclusion

In summary, the results of the present study corroborate the results of previous investigations and suggest that phonological awareness plays an important role in learning to spell. On the other hand, it must be noted that both experimental and control groups improved significantly, suggesting that the lexical spelling strategies taught to both groups were to some extent effective. However, when phonological spelling strategies were taught in combination with the lexical spelling strategies, the experimental group performed better in spelling than the control group, suggesting that a combined instruction of lexical and phonological spelling strategies was even more effective than teaching lexical spelling strategies alone.

The findings of this study do not suggest that the only way to teach spelling to children diagnosed with dysorthographia is to switch wholesale from the lexical approach to the lexical-phonological approach to spelling. Rather, the study suggests that including some teaching about phonological spelling strategies during everyday spelling activities may benefit such children, by helping them to make connections between the orthographic patterns of letters in words and the sounds at a psychologically accessible level. Previous research (e.g., Rohl and Pratt, 1995) shows that phonological awareness may be a necessary but not a sufficient condition for learning to spell. This means that children diagnosed with SLD in spelling or dysorthographia may possess some phonological awareness, but they fail to employ it because they are otherwise directed by a particular teaching method and rarely employ the alphabetic principle (McGuinness, McGuinness, & Donohue, 1995). However, since the present research was only concerned with the teaching of children diagnosed with SLD in spelling or dysorthographia, further research using similar strategies with other Singaporean children without specific learning disabilities appears to be warranted. There is also a need for further research to determine whether the introduction of hanyu pinyin (the Romanized version of Chinese) in Chinese instruction would lead to a greater awareness of sounds in the spelling of English words.

In conclusion, the results of this study show that children with SLD in spelling or dysorthographia who had made little progress in spelling English words, despite previous remediation programs, were able to show an average spelling of 1.13 years over the seven weeks of the program in which they were taught to use a combination of lexical and phonological spelling strategies.

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Appendices

Appendix 1: Mean scores (M) and standard deviations (SD) for all variables

Variables	Groups				Analysis of Variance		
	Experimental		Control		Group	Time	Interaction
	M	SD	M	SD	F(1, 38)	F(1, 38)	F(1, 38)
1. Schonell Graded Spelling					2.24	1626.88***	174.48***
Pretest	19.5	7.16	18.7	7.14			
Posttest	30.8	7.51	24.45	7.51			
2. Visual Discrimination					2.00	7.43**	0.00
Pretest	9.7	0.64	9.45	0.97			
Posttest	10.0	0	9.75	0.54			
3. Visual Sequential Memory (Pictorial)					0.82	62.51***	2.81
Pretest	12.7	1.1	12.55	1.07			
Posttest	13.7	1.23	13.2	1.21			
4. Visual Sequential Memory (Symbolic)					1.73	44.0***	7.74**
Pretest	13.4	1.24	13.2	1.44			
Posttest	14.5	1.07	13.6	1.28			
5. Auditory Sequential Memory					2.28	134.41***	14.93***
Pretest	11.85	0.96	11.75	0.77			
Posttest	13.2	0.96	12.4	0.92			
6. Sound Discrimination					0.68	85.17***	8.56**
Pretest	17.4	1.99	17.2	2.25			
Posttest	18.8	1.64	17.9	2.07			
7. Sound Blending					1.47	77.03***	21.91***
Pretest	13.25	1.67	13.05	1.66			
Posttest	14.4	1.36	13.4	1.50			

NOTE: * p < .05

** p < .01

*** p < .001

Appendix 2: A Summary of 2-Way ANOVA of the Experimental Study

Tasks	Sources of Variation	Sum of Squares (SS)	Degree of Difference (df)	Mean Square (MS)	F value	Significance of F (p)
Spelling ability/competence	Between groups	252.05	1	252.05	2.24	.14
	Error (between-subjects effects)	426.15	38	112.29	-	-
	Between pretest & posttest	1462.05	1	1462.05	1626.88	< .001
	Interaction	156.80	1	156.80	174.48	< .001
	Error (within-subjects effects)	34.15	38	0.90	-	-
Visual discrimination	Between groups	1.25	1	1.25	2.00	.165
	Error (between-subjects effects)	23.70	38	0.62	-	-
	Between pretest & posttest	1.80	1	1.80	7.43	.01
	Interaction	0.00	1	0.00	0.00	1.0
	Error (within-subjects effects)	9.20	38	0.24	-	-
Visual sequential memory (pictorial)	Between groups	2.11	1	2.11	0.82	.37
	Error (between-subjects effects)	98.28	38	2.59	-	-
	Between pretest & posttest	13.61	1	13.61	62.51	< .001
	Interaction	0.61	1	0.61	2.81	.10

	Error (within- subjects effects)	8.28	38	0.22	-	-
Visual sequential memory (symbolic)	Between groups	5.51	1	5.51	1.73	.196
	Error (between- subjects effects)	121.17	38	3.19	-	-
	Between pretest & posttest	12.01	1	12.01	44.0	< .001
	Interaction	2.11	1	2.11	7.74	.008
	Error (within- subjects effects)	10.37	38	0.27	-	-
Auditory sequential memory	Between groups	3.61	1	3.61	2.28	.140
	Error (between- subjects effects)	60.28	38	1.59	-	-
	Between pretest & posttest	19.01	1	19.01	134.41	< .001
	Interaction	2.11	1	2.11	14.93	< .001
	Error (within- subjects effects)	5.38	38	0.14	-	-
Tasks	Sources of Variation	Sum of Squares (SS)	Degree of Difference (df)	Mean Square (MS)	F value	Significance of F (p)
Sound discrimination	Between groups	5.51	1	5.51di	0.68	.416
	Error (between-					

	subjects effects)	310.17	38	8.16	-	-
	Between pretest					
	& posttest	21.01	1	21.01	85.17	< .001
	Interaction	2.11	1	2.11	8.56	.006
	Error (within-					
	subjects effects)	9.38	38	0.25	-	-
Sound blending	Between groups	7.20	1	7.20	1.47	.234
	Error (between-					
	subjects effects)	186.75	38	4.91	-	-
	Between pretest					
	& posttest	11.25	1	11.25	77.03	< .001
	Interaction	3.20	1	3.20	21.91	< .001
	Error (within-					
	subjects effects)	5.55	38	0.15	-	-

NOTE: Between-subjects effects and within-subjects effects (errors) have no *F* values because they are used as denominators of the various *F* ratios and are not themselves the subjects of any statistical test.

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