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A Bilingual Child Learns Social Communication Skills through Video Modeling-A Single Case Study in a Norwegian School Setting

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Abstract

Video modeling is one of the recognized methods used in the training and teaching of children with Autism Spectrum Disorders (ASD). The model's theoretical base stems from Albert Bandura's (1977; 1986) social learning theory in which he asserts that children can learn many skills and behaviors observationally through modeling. One can assume that by observing others, a child with ASD can construct an idea of how new behaviors are performed, and on later occasions this mentally and visually constructed information will serve as a guide for his/her way of behaving. There are two types of methods for model learning: 1) *In Vivo Modeling* and 2) *Video Modeling*. These can be used a) to teach children with ASD skills that are not yet in their behavioral repertoire and / or b) to improve the children's emerging behaviors or skills. In the case of linguistic minority children at any stage of their bilingual development, it has been presumed that some of their behaviors that can be interpreted as attitude or culture-related actions. This approach, however, can sometimes delay referral, diagnosis, and intervention. In our project, we used *Video Modeling* and achieved positive results with regard to teaching social communication skills and target behavior to an eleven year-old bilingual boy with ASD. Our study also reveals that through *Video Modeling*, children with ASD can learn desirable behavioral skills as by-products. *Video Modeling* can also contribute positively to the social inclusion of bilingual children with ASD in school settings. In other words, bilingual children with ASD can transfer the social communication skills and targeted behaviors they learn through second-language at school to a first-language milieu.

Keywords: Autism spectrum disorders (ASD), Video modeling, Bilingual children with ASD, Prevalence of ASD in Norway.

Introduction

Video Modeling is one of the recognized methods used in the training and education of children with autism spectrum disorders (ASD). The model's theoretical base stems from Albert Bandura's (1965, 1977) social learning theory in which he asserts that children can learn many skills and behaviors observationally through modeling. By observing others,

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children with ASD can construct an idea of how new behaviors are performed, and on later occasions this mentally and visually constructed information serves as a guide for their own behavior.

Children with Autism Spectrum Disorders as Visual Learners

Visual learning strategies are defined as two- or three-dimensional representations of a particular concept used to communicate and teach that idea. These strategies can take the form of pictures, icons (black and white cartoon like images), photographs, or gestures to enhance the understanding of spoken word(s) in communicating an idea. In this way, visual systems are used to strengthen the child's understanding and use of communication in his/her environment by taking advantage of the visual learning strengths of children with autism. Indeed, there is some evidence that individuals with ASD are able to process two- or three-dimensional visual supports more easily than transient input, such as auditory stimuli (Quill, 1997). Visual supports are therefore often used to aid children with ASD to maintain attention, understand spoken language, and sequence and organize their environments (Hodgdon, 1995). Hodgdon described visual supports as tools used to compensate for difficulties not only in attention, but also in auditory processing, sequencing, and organization. She contended that children with ASD display fewer behavioral problems and increased compliance when visual supports are used to communicate expectations as opposed to when these supports are not used in structured environments (i.e., school classrooms). One particularly effective visual learning strategy that has been used to teach children with autism conversational skills is *Video Modeling*.

Ozonoff et al. (1991), examined the skills of 23 individuals with autism (ages 8-20) and with IQs above 69. These individuals were matched to controls on IQ, age, gender, and SES. These researchers presented the participants with a wide variety of tasks, including a verbal memory test (Buschke Selective Reminding Test) and the Children's Embedded Figures Test (visual task). Ozonoff et al., found that those individuals with autism presented lower scores on a verbal memory test, but that there were no between-group differences on the visual task. This indicates that although individuals with autism showed deficits in verbal skills, they showed no deficits in visual skills. On the basis of these and other studies, it is established that children with ASD can be considered visual learners (Charlop-Christy, et al. 2000; Schreibman et al, 2000). There are two types of methods for visual learning: *1) In Vivo Modeling* and *2) Video Modeling.* These methods targeting desirable behaviors and skills through observation.

In Vivo Modeling

In Vivo Modeling seeks to promote visual learning through the observation of live models, including children or adults. These models may be the child's parents, siblings, teachers, or classmates. These examples allow for the subjects to model a specific kind of target behavior in a familiar context where such target behavior might naturally occur. *In Vivo Modeling* is regarded as an effective training strategy for children 2-15 years old with autism (Jahr et.al., 2000). Yet this procedure can have some limitations. *In Vivo Modeling* is time consuming, requiring intensive training of models. Another critical aspect of this method is that models sometimes that lack the necessary precision and consistency in their behavior. Furthermore, *In Vivo Modeling* necessitates the imitation of complex tasks in live models that the child must focus on, responding to several of its characteristics. This can create several problems for children with Autism Spectrum Disorders (ASD) because many of them struggle with attention and especially with over selectivity. This creates obstacles for them in drawing attention to the essential aspects of the behavior in the living models (Charlop-Christy et al., 2000).

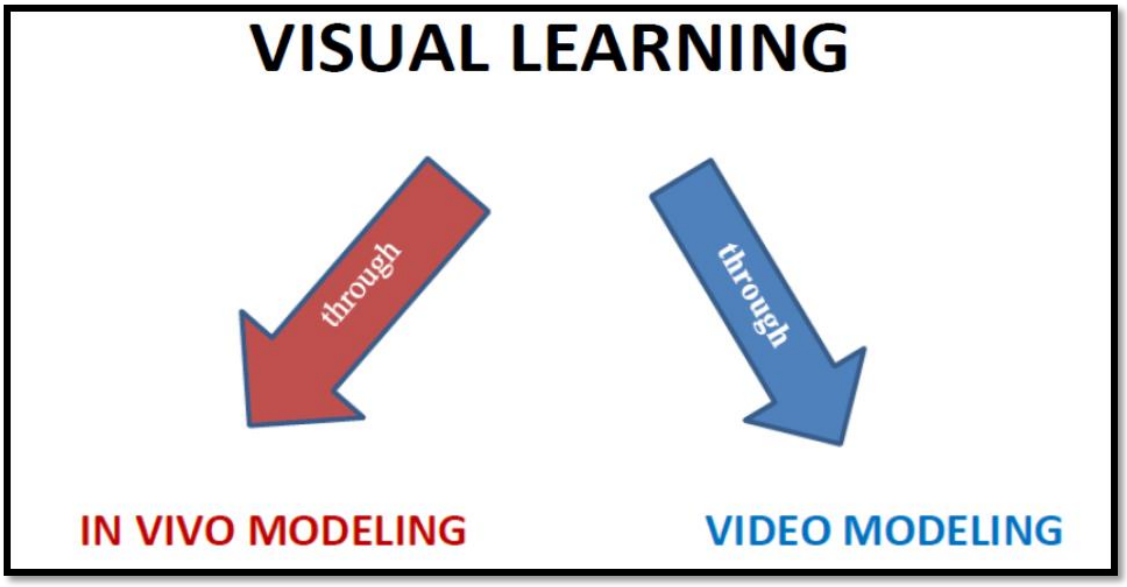

Figure 1. Two methods for visual learning

Video Modeling as an academic durable training, treatment, and teaching program for children with ASD

Video Modeling, as compared to *In Vivo Modeling,* seeks to promote visual learning by observing and imitating models that have been recorded on video and are observed by the child on a television, computer monitor, iPads or other mobile devices like iPhones. Clips from other video sources, such as from YouTube, may also be employed. *Video Modeling* can be used:

a) to teach skills to children with ASD that are not yet in their behavioral repertoire

b) and / or to improve children's emerging behaviors or skills.

Video Modeling is an effective and well-researched intervention for children with ASD, requiring them to simply watch short, filmed clips of a model completing a targeted behavior or behaviors. The child is then given the opportunity to demonstrate the observed behavior (Bellini & Akullian, 2007). In traditional *Video Modeling* programs, the child watches the video on a television screen or computer monitor repeatedly until he or she consistently exhibits the modeled behaviors. Recently, *Video Modeling* has been addressed using portable apparatus such as iPads, iPhones, and iTouch. While recent research on the utility of doing *Video Modeling* is mixed, and further research needs to be carried out, the efficacy of *Video Modeling* remains a robust finding in the United States. A recent literature review (Øzerk & Øzerk, 2013) revealed that American researchers have made tremendous progress concerning assessment, diagnosis, training, treatment, and teaching in the past three decades. Several studies have shown that behaviors, skills, and learning material to be learned by children with ASD is often best presented via visual stimuli; training and teaching activities using *Video Modeling* procedures can therefore be seen as an effective means of intervention

Researchers Steinborn and Knapp (1982) used *Video Modeling* to make a child with autism familiar with the traffic on their local street corner. The first exercises focused on pedestrian crossing and took place in a decorated classroom, where traffic and intersections were artificially made. Later, the method was used to help children transfer and apply these skills in their local environment.

Haring and Lovinger (1989) used *Video Modeling* to teach three children with ASD to go shopping using a stepwise procedure. Charlop et. al. (1990), taught two children with ASD to participate in games and learn turn taking in cooperative play using *Video Modeling*. Taylor et. al. (1999), conducted two experiments. In the first, researchers had children with ASD observe siblings and an adult as models using *Video Modeling*. The results showed that both of the children with ASD had learned to communicate adequately about interacting with adults in several play situations.

Using a multiple-baseline, within-subject comparison design, Charlop-Christy and colleagues (2000) compared the effectiveness of *In Vivo Modeling* and *Video Modeling*. Two behaviors of similar difficulty were selected for each participant and randomly assigned to be targeted via *In Vivo* or *Video Modeling*. In both examples, the child observed the targeted behavior (either by watching a live model or a televised clip) and was then instructed to demonstrate that behavior. Four of the five children acquired the behaviors targeted by *Video Modeling* faster than those targeted by *In Vivo Modeling*. For the fifth child, the rate of acquisition was the same for both training and teaching conditions. Further, *Video Modeling* was found to lead to better generalization across persons, setting, and stimuli. This increased utilization of acquired skills in untrained environments indicates that *Video Modeling* interventions are more likely to affect the children's functioning during their daily routines, which is the ultimate goal of training, treatment, and teaching. These findings support the efficiency of *Video Modeling* interventions.

In another study, Charlop and Milstein (1989) addressed the development of social-communicative skills by children with ASD. They found that *Video Modeling* increased the conversational speech of three children with autism. During baseline, the children only spoke in short phrases. Following intervention, the three children were able to engage in conversations with phrases of up to eight words. Further, the children increased their conversational speech when discussing new topics, interacting with different conversational partners, in novel settings, and in the 15 months after intervention was completed. Sherer et al. (2001), also used *Video Modeling* procedures to increase the level of conversational speech of children with autism. In addition to increasing conversational speech, *Video Modeling* has been used to effectively to promote variation in conversational speech (Charlop et al., 2009). After watching video clips consisting of multiple conversational topics, the children with autism in that study demonstrated more variation in their own conversation.

Adaptive skills have also been targeted with *Video Modeling*. Shipley Benamou et al. (2002), conducted a study that included three children with ASD. Other children with ASD (self-modeling) and several peers were used as models. The training focused on the following daily living skills such as making orange juice using a juicer, completing a letter to be mailed, taking care of animals, cleaning an aquarium, and covering a table.

The study used positive reinforcement to reward correctly implemented activities. To prepare each training video, the target behavior was analyzed in detail. Each skill was divided into sequences. The filming of these skill sequences was done from the child's perspective and focused only on the body parts that conducted each action sequence. This study proved that *Video Modeling* can be an effective educational strategy to promote such skills in children with ASD.

Utilizing *Video Modeling* can also increase other communicative behaviors. Nikopolous and Keenan (2004) used *Video Modeling* to target verbal and gestural play initiations. After watching the videos, the three participants in this study were found to increase their social initiations. Gains were maintained as long as 3 months following intervention. *Video*

Modeling procedures also effectively increased the spontaneous verbal requests of young children with autism (Wert & Niesworth, 2003; Özerk & Özerk, 2013).

D'Ateno et al. (2003), showed *Video Modeling*-clips to increase the solitary pretend play of a child with autism. After watching the videos, the child in this study increased both his play actions and verbalizations. These findings were later replicated with a larger sample of preschool children with autism (MacDonald et al., 2005). Additionally, those children also exhibited unscripted play actions and verbalizations.

Several other studies investigated the efficiency of *Video Modeling* through single case studies or studies with small groups of school age children with ASD. For example MacDonald et al. (2009), used *Video Modeling* to teach reciprocal pretend play to two children with autism (5, and 7 years) to engage in reciprocal pretend play with typically developing peers. They found that these two children with autism and their typically developing peers acquired the targeted skills. At the same the children with autism improved other social communication skills like verbalization, reciprocal verbal interaction and cooperative play.

Another study with *Video Modeling* (Rayner, 2010) showed that a 12 years old boy with ASD learned task completion and improved his skills brushing his teeth. Plavnick and Ferreri (2011) found that *Video Modeling* increased the functional mands (i.e., verbal behavior that specifies a desired outcome) demonstrated by children with autism and that children generalized observed gains. Lydon et al. (2011), found that *Video Modeling* increased the scripted play actions and verbalizations of 5 children with autism and that the children also exhibited increases in untrained settings.

Video Modeling has also been used to simultaneously target multiple verbal and nonverbal social-communicative behaviors (Charlop et al., 2010). During intervention, the three participating children watched video of an adult actor demonstrating appropriate verbalizations, intonations, gestures, and facial expressions. After watching the video three or four times, all of the children increased their demonstration of at least three of the four behaviors.

The previously described study by Charlop-Christy et al. (2000), included increased similar adaptive skills, like brushing teeth and combing hair. Additionally, *Video Modeling* coupled with other teaching strategies has facilitated the adaptive skills of children with autism. Alcantara (1994) used *Video Modeling* and other instructional strategies (including additional prompts and reinforcement) to teach children with autism and autistic tendencies to purchase items.

Ozen et al. (2012), studied teaching sociodramatic play skills to three 9-years old children with autism through *Video Modeling* in small group arrangement. The results of their study revealed that participants acquired their own roles via *Video Modeling.* In addition, they maintained the skills they acquired two weeks after the training sessions were completed. Huaqing Qi and Lin (2012) conducted a meta-analysis to determine the effectiveness of *Video Modeling* interventions on the social and communication skills of children with ASD. The researchers included twenty-six single-case design studies in their analysis. They concluded that their meta-analysis showed that *Video Modeling* interventions had a 53% improvement rate from baseline to phrases on enhancing the targeted social and communication skills for 59 children in these studies.

Here it's important to note that a vast majority of the above-mentioned psychological and educational research studies have focused on the treatment, training, and teaching of social communicative and adaptive skills in experimental studies and clinical settings.

There have been, however, several studies conducted in recent years in which *Video Modeling* was the dominating method researchers utilized in a school setting for children. As one example, Paterson and Arco (2007) targeted verbal and motor play behavior in two school-age children. They used a *Video Modeling* procedure and instructional prompts, redirection, and reinforcers, with young adults as the models. Their design was multiple-baseline across toys and a reversal. Their results show that *Video Modeling* helped children to increase their skills for appropriate play while their repetitive behavior decreased. In another study within a school setting using three school-age children, Nikopoulos and Keenan (2007) used peers as models and targeted the following skills: Social initiations, reciprocal play, and imitation. The results of this study showed that by utilizing *Video Modeling*, the three children with ASD improved the target skills. At the same time, they were able to generalize social initiations, reciprocal play, and imitation across peers. Moreover, they maintained these skills after the sessions were completed.

Another study by Scheflen et al. (2012), aimed to teach four young children with autism developmentally appropriate play and connected speech through the use of *Video Modeling*. They concluded that the four children with autism could successfully use *Video Modeling* to learn how to play appropriately with toys in both structured and generalized situations. But their progression was not very clear even though some of them demonstrated considerable improvement in their social communication in play.

In recent years several studies attempted to draw a conclusion about the effectiveness of *Video Modeling*. Acar and Diken (2012) concluded on the basis of the review of 31 studies on *Video Modeling* that video modeling is effective for teaching social skills, play skills, language and communication skills, functional skills, self-care skills, and daily life skills to children with autism. Another similar study conducted by Wilson (2013) focused on the use of *Video Modeling* in the school settings and concluded that *Video Modeling* is an evidence-based practice and it can be used easily and effectively in the school setting. As one can see in the following sections in our paper, we are not sure whether *Video Modeling* is so easy to use as an intervention method as one can get the best impression of Wilson's conclusion although the method may be effective.

Prevalence of ASD and bilingual children

Autism is the fastest-growing developmental disorder in the United States, and very likely in many other countries as well (Kim et al., 2011). The cause of this increasing rate of autism, however, remains unknown (Özerk & Özerk, 2013). When Leo Kanner described autism for the first time in 1943, he estimated autism incidence at 1 in 10,000 children. In the 1980s this ratio had risen to 2.5 per 10,000 births (Jepson & Johnson, 2007). By the 1990s, about 1 in 500 births were affected by autism spectrum disorders in the United States alone (American Psychiatric Association[APA], 2000). Several studies since that time (Yeargin-Allsopp et al., 2003; Bird et al., 2006) have further documented that when autism spectrum disorders (ASD) include Asperger Syndrome and pervasive developmental disorders otherwise not specified (PDNOS) in addition to the autism disorder, the prevalence of ASD is 1 in 166, or 1 in 155 people (Fombonne, 2005).

Based on the available data collected from the health and special education records of children who were 8 years-old and lived in areas of Alabama, Arizona, Arkansas, Colorado, Georgia, Maryland, Missouri, New Jersey, North Carolina, Utah, and Wisconsin in 2010, it was found that about 14.7 per 1,000 8 year-olds (or 1 in 68 American children) had been identified with autism spectrum disorder (estimates from the CDC's Autism and Developmental Disabilities Monitoring (ADDM), Network (2014). Here we see a significant increase in the incidence of ASD among children in US during the last few decades.

Several population studies in the 1980s and 90s concluded that a higher proportion of children from immigrant families than non-immigrant families experienced autism spectrum disorders (Gillberg et al, 1987; Goodman & Richards, 1995). A report published by the Autism Society of America (2000, s.3) states that ASF "... knows no racial, ethnic, or social boundaries." It also states the following about the relationship between social status and the incidence of autism: "Family income, lifestyle, and educational levels do not affect the chance of autism's occurrence". A comprehensive epidemiological study of 12,000 children in the UK concluded that there is no correlation between ethnicity and the prevalence of ASF (Fombonne et al., 2001). Meanwhile, a Swedish study in the city of Göteborg in Sweden (Nygren et al., 2011) revealed a dramatic increase of ASF among two year-olds. In 2000 the rate was 0.18% (*n*= 4,871); in 2005, 0.04% (*n*= 5,220); and in the latest survey in 2010, 0.80% of the city's two year-olds (*n*= 5007), in other words 1 of 125 children there were diagnosed with (ASD). In another extensive study in the Swedish capital city of Stockholm (Barnevik-Olsson et al., 2008) it was revealed that the incidence of autism disorder or pervasive developmental disorder is 3 to 4 times higher among children with Somali-Swedish background than other categories of children. The incidence rate is 1 out of 143 among Somali-Swedish children and 1 in 518 among children with non-Somali-Swedish backgrounds. It is difficult to explain this difference, and more research is needed in this area.

The incidence of autism in Norway and bilingual children

We do not have many studies or statistics about the incidence of ASD in Norway, but those we do have are quite informative. Gundersen and Hem (2008) reported that about 1 in 2,000 people in the 1970s and 80s were diagnosed with autism in Norway. In the late 1990s, this ratio became 1:1000. More recently, a 2010 a survey (Isaksen, 2010) revealed that in the counties of Oppland and Hedmark (2 of Norway's 19 counties), 1 in 210 children had been diagnosed with autism. A nationwide survey in Norway (Stoltenberg et al., 2010) revealed that 6 of 1,000 children have ASD. This means that 1 in 167 children were diagnosed with autism spectrum disorder in Norway in recent years. This survey covered the period from 1999 to 2009 and included 108,500 children who were 0-10 years old in this period. Two years later, Suren et al. (2013), from the same research group, found that the prevalence of ASD among 6 to 12 year-old children born in the period 1999–2011 was 0.6%. This equates to an average of 1 in 167 children in Norway being diagnosed with ASD in 2011. On the other hand, similar to U.S. statistics, the study found differences between Norway's 19 counties with regard to the prevalence of ASD. While in one of the counties, approximately 1 in 80 children were diagnosed with ASD, this ratio was approximately 1 in 330 in another county.

Bilingual children with autism spectrum disorders in Norway

According to official statistics (SSB Population 01.01.2011), the number of children with a bilingual background, that is to say, children with another language background than Norwegian-in the age range of 0 to 19 years-old, is around 167,000. These figures include indigenous children with Sami language background, national minorities, and linguistic minorities from families with an immigrant background. On the basis of the above-mentioned prevalence of ASD among those 0-19 years-old in the entire population, we can estimate that about 1,000-1,300 children with a bilingual background have ASD in Norway.

Unlike in the U.S., the educational authorities in Norway do not have any policy in which “evidence-based programs" or “*effective models*” are identified and made mandatory for treatment, training, and the teaching of children with ASD. Children with ASD go to ordinary schools in which there is a unit for children with ASD or a unit for children with

special needs. Each school or each unit decides how they want to work with these children and what types of methods they wish to utilize.

A single case study of Video Modeling in a Norwegian contest

Within the above-described educational context, we decided to use *Video Modeling* as an intervention strategy for an 11 year-old boy—hereafter Allan—in one of the neighboring municipalities of the capital city of Oslo. Allan is a bilingual child. His parents came to Norway as immigrants when Allan was 3 years-old. Allan was enrolled in Norwegian-speaking kindergarten when he was 5 years-old. After a year in Norwegian kindergarten, he began attending a public school at the age of 6. His home language was not Norwegian. His public school was a monolingual Norwegian school. During his initial three years, the school observed that Allan struggled with learning Norwegian as a second language, as well as social communication, reading, writing, and academic learning. When Allan was 9 years-old, he was referred to educational-psychological services for assessment and then to a neurologist. He received the diagnosis of autism at the end of third grade. In fourth grade, Allan's school set up an intervention plan to help him in reading, writing, and content area subjects. For this purpose, Allan was assigned eight hours for supportive teaching. Six hours were used by a Norwegian speaking teacher and two hours by a bilingual teacher.

This initiative helped Allan to start to improve his reading skills and become more involved in academic activities, but he only communicated with his second language teacher and bilingual teacher in one-on-one situations. Despite his areas of improvement, Allan still had huge problems with social communication and establishing friendships with classmates. He did not participate in any play or other social activities during class breaks. While other children played in the school yard, Allan would circle the schoolyard alone. At the beginning of fifth grade, we were contacted by the school to discuss intervention strategies.

During the first four years of Allan's schooling, the school did not use any clear method for developing his social communication skills. The school principal and the teachers who worked with Allan informed us that they were interested in improving their competency in different intervention methods, however. After receiving consent from Allan's parents, we read the medical and educational/psychological reports about Allan and talked to his parents, the school's principal, and his teachers.

In the referral reports, the school wrote, among other things, that *"The school believes that Allan dislikes the Norwegian language and Norwegian culture"*. In our meetings, one of the sentences the principal used was: *"I have never seen Allan smiling".* At the same meeting, one of the teachers expressed herself in this way: *"We need help to help Allan".*

During this initial period of our intervention study we observed Allan in the class and in the school yard. As it was mentioned earlier in the article, Allan had huge problems with *social-communication.* We identified the following:

a) *"Giving positive response to others' initiative for playing together"* and

b) *"Taking initiative for playing together with his friends"*

as the skills that Allan needed to learn. At the same time, we picked up signals that basketball could be one of the games that Allan was interested to play. During this planning period, we also observed that Allan played chess with only one of his Norwegian teachers and not with his peers.

Initiation and implementation of Video Modeling

We decided to use *Video Modeling* and utilize single subject analysis, the most common type of research design used for treatment analysis for behavioral interventions (Cooper, Heron & Heward, 2007) and specifically for *Video Modeling*.

We discussed our plan with Allan's parents, teachers, and the principal. It was necessary for us to explain what this method is about and make a plan for training his teachers and peers (classmates) as models. 8 of his classmates (3 girls and 5 boys) were chosen as models because they expressed interested in modeling. Then we received permission from their parents, all before summer holiday. After summer holiday, the school session started in August, and we set up our single case study on *Video Modeling*. Allan was now at fifth grade.

We spent about three weeks (From mid-august to first week of September) on the training of his full-time Norwegian teacher and the eight model peers. During this period, we registered a baseline for the skills that Allan needed for learning the target behavior*: "Giving positive response to others' invitation for playing basketball and chess together"* is an example*.* We identified the following skills that he needed to learn:

Table1. *Target behavior and the skills to be learned*

TARGET BEHAVIOR:	"Giving positive response to others' invitation for playing basketball and chess together"
SKILLS TO BE LEARNED:	
1.	*Turn to a friend who invites him to play basketball*
2.	*Establish eye-contact*
3.	*Participate in play in an active manner*
4.	*Demonstrate turn-taking in play*
5.	*Participatie in play at least 20 minutes without encouragement*
6.	*Give positive feedback to the friends by using appropriate words and expressions*

As mentioned earlier, basketball and chess were two of the games that Allan was interested in. We chose basketball for teaching him the skills he needed to master the target behavior. The reason for choosing basketball to start with was twofold:

a) We observed that Allan liked to watch others playing basketball, and we interpreted this as a sign that he wished to play basketball,

b) The season was suitable for basketball, and his peers were familiar with playing basketball at the school yard.

Baseline

We spent 5 weeks (three weeks in September and two weeks in October) to establish a baseline for the above-mentioned skills in the school year 2011-2012: mid-August to mid-June. During this baseline-period, we also had to involve Allan and try out some of the video-clips. We determined that we also needed to train Allan to learn from *Video Modeling* (See Figure 2).

Intervention with Video Modeling

After the period of training Allan's teacher and his peers and the baseline-period, we started to apply *Video Modeling*. In the first phase of the intervention, two video-clips were made and shown to Allan in a group room. The video clips included all the above-mentioned six skills. The language of communication was Norwegian. At the same time, his peers took initiative and invited Allan to play basketball during the school recesses. The 'peer-initiatives' included also the six skills.

The first phase of the intervention lasted six weeks (from the first week in November to the second week in December). The training of the targeted six skills was based solely on basketball.

The second phase of the intervention was also six weeks (from the last week of February to the first week of April). In this phase, the skills-training was based on *chess.* We knew Allan was also interested in playing chess, as were his peers.

Between the third week in December and first week in February, there was a Christmas holiday. In the other weeks before we started the second phase, the teachers and the model-peers continued to the *Video Modeling* with Allan. Between the second phase and the third phase, the schools had their Easter holiday.

The results of the training with *Video Modeling* are presented in the figure 2 below:

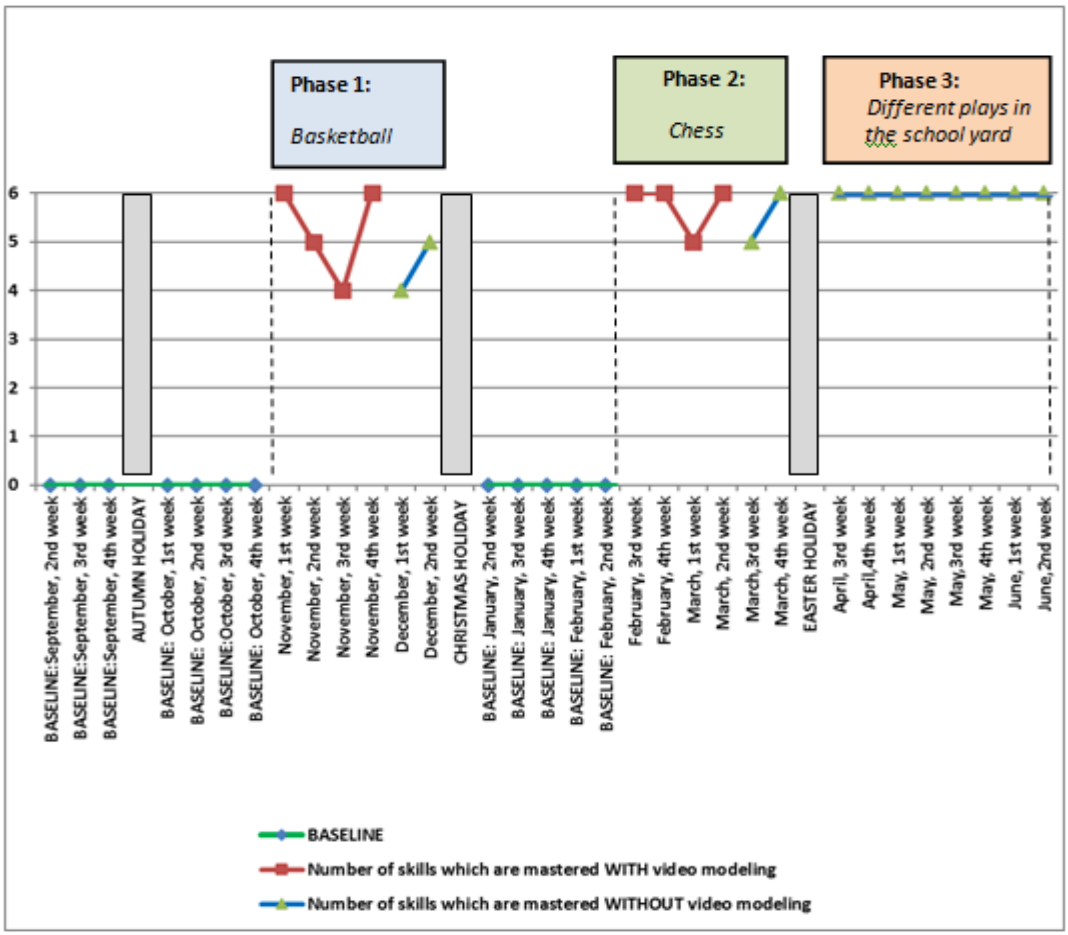

Figure 2. The results of the training with *Video Modeling*

As one can see in the figure, the overall intervention period was from the second week in September through the second week in June. During this period, there were holidays as noted (Autumn, Christmas, and Easter) and other activities at the school. Therefore systematic training with *Video Modeling* was conducted in a shorter period than ten months.

We spent seven weeks for determining an accurate baseline before *Video Modeling* related to 'Basketball' and five weeks establishing the baseline related to 'Chess'. As it is shown in the figure, Allan did not master any of the six skills he needed for social communication during the baseline, thus he could not give positive responses to his peers' initiatives for playing basketball.

Playing basketball as an arena for social skills training

It was interesting to register that Allan succeeded to use all the targeted six skills with *Video Modeling* within just the first week. When he was informed about the intervention plan and when he saw his friends' coordinated engagement to include and help him in playing basketball, he showed extraordinary effort and demonstrated that he could observe and imitate the models.

In the second and third week, we registered some retrogression. The main reason for this was that Allan seemed tired, but we could not discover why he seemed tired. The other reason was the distraction of a cat that was in the classroom, which captured his attention several times. However, in the fourth week (fourth week in November), Allan demonstrated that he could use all the six skills in basketball when he watched the skills demonstrated in the video prior to his peers' invitation. During the fifth and sixth weeks in the first phase of the intervention, Allan started to use 4 to 5 of the targeted skills related to basketball without *Video Modeling* taking place. Since Allan was also interested in chess, we decided to expand training at that point with chess.

Playing chess as arena for social skills training and transfer of skills

In the second phase of the intervention period, we covered the skills needed to play chess. During the first two weeks in this phase (3rd and 4th weeks of February), Allan could not transfer the six skills he learned in the first phase to playing chess without *Video Modeling*. In other words, he needed repeated exposure to the visual learning presentation of the same six skills by observing and imitating his peers on video. He was then given the opportunity to train more with *Video Modeling*. In the following two weeks (1st and 2nd weeks of March) he could master 5 to 6 of the targeted skills with the help of *Video Modeling*. But in the consecutive two weeks (3rd and 4th weeks of March), Allan showed significant improvement. He could demonstrate almost all six of the targeted skills without the reinforcement of *Video Modeling*. Now he could give positive response to others' initiatives for playing basketball and chess together.

The third phase and the generalization of skills to other games

The third phase of the intervention started at the 3rd week of April, after the Easter holiday. Since we had observed that Allan was able to give positive responses to others' initiatives for playing basketball and chess together without *Video Modeling*, we proposed that friends invite Allan to group games that were popular at that time at the school. We observed that along with basketball, there were three other popular ball-games: "kick the can", "the wall game" and "juggling with soccer ball".

As we were planning to make video-clips related to these games, Allan's friends took the initiative and invited Allan to participate in the mentioned games. We observed that Allan could generalize the skills he had already learned through *Video Modeling* to the new

play situations and new games. As one can see in the figure, he manages to give positive responses to his friends' initiative and play with them in eight weeks without *Video Modeling*.

The parents' experiences

During this third phase, we talked to Allan's parents to learn information about their observations of Allan at home, their experiences about the project period, and their overall views on his progress. Allan exhibited improvement in his social communication skills in communicating via his mother tongue at home. He could respond positively to other's initiatives and he himself could take the initiative for collaborative activities at home. These were skills and behaviors that he could not master prior to the project. We interpret this as transfer of the learned social skills and targeted behaviors in a second language to a first language. .

A new behavior as byproduct

As mentioned earlier in this article, the second targeted behavior was *'Taking initiative for playing together with his friends'.* Our plan was to use *Video Modeling* for teaching Allan this behavior as well. But during the third phase of the intervention, we observed that Allan himself started to take the initiative for playing with his friends. He took the initiative several times in a natural manner and received positive responses from his friends. We can therefore conclude that *Video Modeling* has the potential to create conditions for learning certain additional desired target behaviors as *byproducts.*

Other academic-related skills corresponding to improving social communication skills

Although the focus of this paper is on *Video Modeling* for teaching and learning certain core social communications skills and behaviors, we also wish to mention another aspect of Allan's situation with regard to other learning areas at the school. Since our *Video Modeling* was conducted in a school setting, we were also given some information about his situation in other areas. As mentioned earlier, Allan was allocated an extra eight hours for partially bilingual supportive teaching in reading, writing, and academic learning when he was in fourth grade. Initially, this initiative showed some positive outcomes. With the help of his two teachers, Allan began to show moderate progress in reading, but after *Video Modeling* he demonstrated significant improvement in reading, writing, and learning in content area subjects. This coincided with his developing the mentioned six skills and the target behaviors through *Video Modeling*.

Discussion

In our paper we refer to several studies, predominantly studies conducted in clinical settings, which indicate that *Video Modeling* interventions effectively facilitate the skill acquisition of many children with autism. Most existing studies of *Video Modeling* utilized single subject analysis. In our study, we did the same and registered the results of our intervention in three periods. We found that *Video Modeling* in the school setting is more challenging than when it is conducted in clinical settings. It was very challenging to registering the results during the process without disturbing the children's activities and without drawing their attention to the registration process. Many of the mentioned studies as well as our study show that the consistently rapid rate of acquisition of the targeted skills suggests that *Video Modeling* interventions may be an especially efficient means of promoting the learning of social communication skills. We suspect that this was the reason that the American expert panel defined *Video Modeling* as one of the evidence-based and established training and teaching methods (The National Autism Center's National Standards Report, 2009). We have experienced that *Video Modeling* takes advantage of the visual processing strengths of learners with ASD (Townsend & Westerfield, 2010). With

regards to bilingual children with ASD, despite the rapidly rising rates of immigration in several countries such as the US, European Union, and Scandinavian countries (equating to a corollary rapid increase of bilingual children in the school systems there), we have extremely few studies focusing on bilingual children with ASD (Seung et al., 2006). This single case study is about an eleven year-old bilingual child with ASD. Our subject had a bilingual life. He used his mother-tongue at home, but went to a school in which Norwegian was the medium of instruction and the language of communication among students. It was remarkable that the school interpreted his problems with social communication as a function of *"Dislike Norwegian language and culture".* The result of the *Video Modeling* demonstrated that Allan did not dislike his second language or the culture of his new country. He only needed help to learn the necessary words, idioms, phrases, pragmatic language skills, and ways of response in different social settings in his second language, in order to be able to give positive responses to his friends' invitations. He could not acquire these skills through natural interaction with his friends because of his ASD. He also did not develop these skills in his mother-tongue before the *Video Modeling* intervention. Extra bilingual support had a positive impact on Allan's initial learning, contributing to making communication and content comprehensible for him. At the same time, his bilingual teacher contributed to better collaboration between home and the school. On the basis of information we received from Allan's parents, we conclude that bilingual children with ASD can transfer the learned social skills and targeted behaviors in a second language to a first language.

Conclusion

Our restricted single case study with *Video Modeling* revealed that children with ASD can use their visual learning channel to acquire the necessary social communication skills they need to master behaviors which they cannot do otherwise. One of the important factors that create the condition for learning through *Video Modeling* is the teachers' interest for learning about *Video Modeling* and using it properly. The other positive factor is choosing model peers who are genuinely interested in making video clips and including their peers suffering from ASD in their games and playtimes. Another lesson that one can draw from our study is that learning targeted skills and behaviors can produce the capacity for several other desired skills and behaviors as by-products. This study showed that '*learning to take initiative for playing together with one's friends*' can be a by-product of '*learning to give positive response to friends' initiative for playing together'.* Another by-product of our *Video Modeling* was inclusion of a child with ASD in more social activities not only by his/her model peers, but also by other peers in the school. Our study of a boy with ASD also revealed that bilingual children with ASD can transfer the learned social communication skills and targeted behaviors in a second language to first language milieu. With this level of success, we feel that there is a strong need for further research in which bilingualism is not under-communicated when one designs, initiates, and conducts intervention with different models for training, treatment, and teaching of children with ASD.

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