

## A Case Series on the Social Thinking Training of Mainstreamed Secondary School Students with High-functioning Autism

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### Abstract

*Despite their satisfactory academic achievement and verbal fluency, students with high-functioning autism encounter great difficulties in using their social and communication skills. The study described herein investigated how effectively a training program in social thinking improved the social communicative functioning of four such students. Quantitative analysis was performed based on the Social Thinking Rating Scale scores of the students' significant others, including parents, teachers and social workers. Qualitative data were collected before and after the training program through individual interviews with the students and their parents. All interviewees noted improvements in various areas after the training program.*

*Key words: Social thinking, high-functioning autism, ILAUGH*

### Background

The study of social thinking requires the investigation of how people process social information through encoding, storage, retrieval, and application to social situations. Social thinking is a dynamic, constantly adapting and ongoing process that requires cognitive problem-solving abilities. Students with pervasive developmental disorders such

as Asperger syndrome and autism are often associated with deficits in social thinking. A diagnostic feature common to both conditions is "abnormal functioning in social interaction with onset prior to age 3 years" (American Psychiatric Association, 2000).

Academic achievement and cognitive functioning are the two major concerns of school placement. Similar to the practice

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in Western countries, most autistic students with normal intelligence in Hong Kong are integrated into mainstream schools to receive education with their non-autistic peers. The aim is to encourage the autistic students to function as effectively as possible in their daily environment.

Recently developed social skills programs for autistic students in Hong Kong include Mind Reading and Social Stories. The Mind Reading curriculum, developed by the Hong Kong Institute of Education (2003), uses role plays to help students appreciate four basic emotions (happiness, sadness, fear, and anger) and the possible forms of behavior leading to those emotions. The Social Stories guide developed by the Hong Kong Spastics Association (2003), based on the work of Gray (Gray, 1994; Gray & White, 2002), provides approaches to writing social stories from student perspectives. By rehearsing these stories, the students are expected to become more prepared to cope with the social situations they encounter in their daily lives.

Through training in Mind Reading and Social Stories, students become more capable of handling anticipated social situations. The two approaches are designed to help younger autistic children with lower levels of functioning. However, autistic children with higher levels of functioning and those with Asperger syndrome lack the ability to deal with the highly flexible social circumstances they encounter daily, even after training in the two methods.

Although services and rehabilitation support are provided for students in Hong Kong's pre-primary and primary schools, relatively few resources are allocated for secondary school students. It is not uncommon for parents to report their teenagers still having marked difficulties in understanding the perspectives of others, reading between the lines, and evaluating the whole situation to work out how to enter a conversation. Given

these difficulties, teenagers with autism and Asperger syndrome often feel alienated and have no genuine friends. Worst of all, they are often bullied at school.

Students with high-functioning autism were the target group of the study reported here. Although they had reasonably developed academic, cognitive and language skills, their impaired ability to decode and encode social skills was a major hindrance for effective integration into the education system.

The study was the first attempt to tailor-make a social thinking training program for students with either high-functioning autism or Asperger syndrome. The social thinking ILAUGH model (Winner, 2000, 2002, 2005) was used as a reference. ILAUGH is an acronym for 1) Initiation, 2) Listening, 3) Abstracting information, 4) Understanding perspectives, 5) Gestalt, and 6) Humor appreciation.

The study's objective was to assess the effectiveness of the social thinking program on mainstreamed secondary school students in Hong Kong with high-functioning autism.

### Method

A case series of four subjects who participated in the social thinking group training program are reported here.

### Subjects

The four subjects were males aged from 14 to 15 with a diagnosis of autism or autistic feature confirmed by a qualified clinical psychologist. The four subjects and their parents were recruited from the Caritas Parent Resource Centre. They had received mainstreamed education since kindergarten and were attending junior secondary school at the time of the training. Table 1 provides a profile of the four cases.

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**Table 1**  
Background information of the four cases

	Sex	Age	Diagnosis (Age at diagnosis)	Intelligence Level	Training History
Case 1	M	15	Autism (Aged 13)	Below average	Theory of Mind training for one year Social skills group training for one year
Case 2	M	14	Autistic Feature (Aged 6)	Average	NIL
Case 3	M	15	Autism (Aged 6)	Average	Speech therapy for 6 years
Case 4	M	15	Autistic Feature (Aged 10)	Above average	Speech therapy for 4 years

**Training Materials**

With reference to the existing literature and available materials, a training program to remediate the social communication problem was designed. The information provided in two books – *Thinking About You Thinking About Me* (Winner, 2002) and *Think Social* (Winner, 2005) – was used to establish the training framework. The two references provided practical guidelines geared towards the needs of the parents and teachers in this relatively new and neglected area. After establishing the theoretical framework, activities and worksheets taking into account the cultural and language characteristics of the local population were designed.

The training sessions mainly pinpointed weaknesses in the six areas highlighted in the ILAUGH model (Winner, 2002, 2005):

- 1) Initiation: the ability to initiate communication or action appropriately;
- 2) Listening: the ability to listen actively with eyes and brain;

- 3) Abstracting: the ability to infer meaning from social cues or work out meanings from words;
- 4) Understanding perspectives: the ability to incorporate the perspectives of other people into the regulation of social relationships;
- 5) Gestalt: the ability to obtain a holistic picture of the communication process; and
- 6) Humor: the ability to appreciate humor and use it when relating to others.

Eight training sessions were conducted, with each lasting for 1.5 hours and including two to three activities. Training content was introduced in the format of role play, discussion, video viewing and group games. In each session, critical vocabularies were introduced to capture the essence of the learning points. Homework sheets for both the students and their parents were distributed. The vocabularies and homework sheets helped the students and their parents to understand the abstract framework and social communication concepts.

**Outcome Measurement**

**Social Thinking Rating Scale (STRS)**

The Social Thinking Rating Scale was developed as an outcome indicator to evaluate the progress of the subjects. The STRS was based on the content of the progress report used by the Social Thinking Centre in San Jose, California with the permission of Michelle Winner. A total of 70 items were devised, with 5, 9, 5, 24, 23, 4 items addressing the respective areas of the ILAUGH model. A total score and six domain scores were generated. The significant others of the students, including their parents, teachers and social workers who were familiar with them, provided the ratings. The raters were required to rate the occurrence of the set forms of behavior on a 5-point rating scale, where 1 to 5 denoted ‘never’, ‘rarely’, ‘sometimes’, ‘often,’ and ‘always,’ respectively. The same questionnaire was completed both before and immediately after the training.

**Individual Interviews**

The students and their significant others

were interviewed twice – once before the training commenced and again at the end of the final training session. Comments about the training program and the students’ behavior were the centre of the discussion.

**Results**

**Quantitative analysis of results from the Social Thinking Rating Scale**

The results obtained from the Social Thinking Rating Scale are shown in Table 2. Each case had at least one parent as a rater. The number of teachers and social workers acting as raters varied from case to case. The scores obtained from the three parties (parents, teachers, and social workers) were combined as mean ratings. The six domain scores and the total scores are tabulated. Comparison of the total scores indicates that there was improvement in all four cases after the training sessions, with the percentage gain ranging from 0.88% to 7.54%. While improvement was noted in all four cases in terms of listening and gestalt thinking, improvement in the other four domains varied. Case 1 did not make any progress in understanding other

**Table 2**

The six mean domain scores and total score of the four cases obtained on the Social Thinking Rating Scale

	Case 1		Case 2		Case 3		Case 4	
	Teacher (n = 12)		Teacher (n = 1)		Teacher (n = 1)		Teacher (n = 1)	
	Social worker (n=2)		Social worker (n=2)		Social worker (n=1)		Social worker (n=2)	
	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>
Initiation	2.56	2.76	3.40	3.27	4.10	3.67	3.73	3.80
Listening	2.64	2.78	2.89	3.11	3.06	3.19	3.67	3.72
Abstracting information	2.40	2.46	2.87	3.27	2.85	3.07	3.20	3.10
Understanding perspective	2.53	2.50	3.10	3.28	2.85	2.87	3.44	3.49
Gestalt	2.53	2.58	3.04	3.36	2.67	3.12	3.33	3.40
Humor	3.45	3.70	2.83	3.11	2.92	3.17	2.75	2.63
Total	2.58	2.68	3.05	3.28	2.94	3.07	3.40	3.43

people's perspectives, case 2 had difficulties in initiation, case 3 made no significant progress in initiation, and case 4 continued to have difficulty abstracting information and using humor.

### *Qualitative Analysis*

Qualitative data about the program were obtained in individual interviews both before and after the training sessions. The following comments have been extracted from transcripts of the post-training interviews.

#### *Case 1*

The training program has made me interact effectively with friends. I am able to make more friends. I know my friends better. I learn how to discriminate good from bad guys. I learn how to converse with others. On the one hand, I talk more with others. On the other hand, I do not hold the floor as long as before.

#### *Parent of Case 1*

He is now quicker to accept the ideas of others, and hence the frequency of argument with others is reduced. He has begun to attend to how classmates comprehend the commands of teachers. He also shows understanding of how others feel. For example, he once reserved a cool seat, where the electric fan reached, for me. This was a very considerate act as he knew I would be very hot after cooking.

#### *Case 2*

I learned how to interact with others, understand others' feelings, words that cannot be said and how to engage in a conversation with others. I did not know how to listen in the past. I only talked about what I am interested in. Now I know I have to use my eyes to look at people to get information.

After joining the training program, my relationship with classmates improved. I

have reduced my episodes of provoking other people. I now play chess with classmates, I tell less dirty jokes; I am able to accept changing rules, for instance, while playing UNO.

#### *Parent of Case 2*

In the group, his behavior was more mature than I expected. His irrelevant speech has disappeared. The training helped him to learn body language and self-control. His tantrum frequency has reduced and he is able to understand others more. I like the training approach in that it requires people to think hard. The critical vocabulary, which we are able to apply in daily life, is very useful. However, the number and duration of the training sessions are not enough. Some content areas are not discussed deeply enough.

#### *Case 3*

The training content needs to be strengthened. More elements regarding what one has to face when joining the workforce in the future would be useful.

#### *Parent of case 3*

The content of the training, which is not covered at school, was very good. I also liked the fact that the abilities of the group members were very similar. He now participates more in interactions. His relationships with family members have also improved. I suggest enlarging the group size to accommodate more participants; seven to eight people.

#### *Case 4*

The training program was enlightening. It made me think about how I could improve myself, for example, by learning how to find suitable topics when talking with others. I now attend more to my own actions, both in verbal speech and non-verbal behavior.

#### *Parent of case 4*

In the past, he would stop participating when in doubt. Now, he is very confused in the sense that he thinks more and more about human relations. He will think about what others are thinking. His relationship with his younger sister has improved. He will also invite others to have dinner. The real-time recording and DVDs [during the program] were all very good. They made the parents as well as the group members learn by viewing their own responses. The trainers were very good with very good preparation. Future training could invite more outsiders such as classmates and strangers to join in. Content areas such as how to handle bullying and how to adjust the volume and tone of voice would be good too. Teachers could also be invited into the group so that they could understand more and take the knowledge back to school.

### **Discussion**

Communication is a complex process that begins a good deal before any conversation starts. The social thinking model stresses the importance of the cognitive processes that operate behind the scenes. The results of the four case series presented here show that the training is generally effective. Despite individual variations in the areas of relative strength and weakness, all four students benefited from participation in the program. Nevertheless, the magnitude of improvement was not very remarkable. There could be a number of reasons for the relatively small degree of improvement. First, the frequency and duration of sessions may have been insufficient. As one of the parents noted, the allocated time for each session was too short. Some of the content areas were not covered thoroughly and discussions were not deep enough. An increased number of sessions would allow the program to include such important topics as handling bullies.

The small sample size may also have impeded the training effect shown, and more subjects should have been recruited into the program. The raters' interpretation of the items on the questionnaire may also have posed a threat to the validity of the results obtained. One of the parents explained that they gave a lower post-training score not because they felt that their child had not made progress, but because they had misinterpreted some of the meanings of the items before the training. For example, when asked about the use of humor, they interpreted certain of their child's forms of behavior as humorous. Only after the training program did they understand that those forms of behavior may be regarded as inappropriate by others when not appropriate in the context.

Notwithstanding these limitations, a number of themes related to the program's benefits can be extracted from the comments of the students and their parents.

Thinking and talking – Thinking about what others are thinking was one of the central themes of the training program. As Winner (2008) stated, social skill production is a dynamic and complex process. Before we can act socially, we need to be able to think socially. It is through this thinking process that individuals are able to judge what subsequent forms of behavior are regarded as appropriate, and subsequently change their verbal and non-verbal behavior when necessary. The students' awareness of the importance of this ability to process information was evident in the repeated emphasis in their reports on having learned to 'think'. The results were expressed as forms of behavior such as 'increasing conversation', 'reduced irrelevant speech', 'talking more', 'awareness of body language' and 'using my eyes to look at people'.

Interaction and others – Interaction was another key word used by the four students. Interaction is a process that involves at least two parties. As a result of the training program,

**Table 3**

Classification of the student descriptions of the training program in relation to awareness, acknowledgement and action.

Awareness	[I am more aware of] how I can improve myself. I wonder what others are thinking. [In the past] I only talked about what I was interested in. He now attends more to how other classmates comprehend teacher commands.
Acknowledgement	He shows an understanding of how others feel. He understands others' feelings. I understand others more.
Action	Now I use my eyes to look at others. He invites others to have dinner. Now I attend more to my own actions.

the students became more attentive to the responses of the others, regardless of whether they were family members, friends, classmates or teachers. These improved interaction skills could be viewed as the students moving through a process of awareness, acknowledgement and action. Table 3 classified their descriptions in relation to this process.

Relationships – One of the desirable outcomes of the program was the students' improved relationships with others. The students and their parents offered comments such as the following: 'I know my friends better', 'The frequency of arguments with others is reduced', 'My relationship with classmates has improved', 'Relationships with family members have improved' and 'His relationship with his younger sister has improved'. The training program emphasized that the students themselves could have a great impact on others, and techniques to sustain relationships in terms of verbal and non-verbal behavior were covered. More importantly, the students were guided to explore the potential consequences of their behavior in terms of forming impressions on others, which affects how those others respond. Understanding

such chain reactions provided impetus for the students to take steps to achieve better relationships with their significant others.

### Conclusion

The essence of the social thinking program is that the learning of content is not based on skill, but rather on cognition. Social rules are highly abstract and cannot be learned effectively through a stimulus-response approach. The training program, offered the four students a way of learning social rules through explicit explanation, analysis and repeated behavioral examples. The results from the four-case series demonstrate that the program is effective in promoting the social communication skills of teenagers with high-functioning autism.

To further investigate the effectiveness of the program in the local setting, 44 teenagers from 14 mainstreamed secondary schools were recruited into a follow-up program. Although detailed analysis of the results is still underway, the enhanced program was generally well received by the teachers, parents and students. The program was extended to

12 sessions with an improved focus on the local culture and language. The basic concepts of social thinking together with suggested training sessions were also collected into a handbook jointly published by Think Social Inc., the Chinese University of Hong Kong, the Caritas Rehabilitative Service, and the Education Bureau (2009). The handbook has been distributed to all normal secondary schools in Hong Kong to promote the training of those students in need.

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### 摘要

#### 社交思考訓練：主流中學高能力自閉症學生案例系列

儘管高能力自閉症學生於學業和言語表達上均有不俗表現，他們在社交溝通方面往往仍面對重重障礙。本專題旨在透過四個個案以探討社交思考訓練課程對改善社交溝通能力的效益。此研究一方面採納了學生的重要夥伴人物，包括父母、老師以及社工，在社交思考等級表上所給予的評分，以進行量化分析。另一方面，各學生及家長亦需於訓練前後接受個別面談，所集得之數據用以作進一步的質性研究。結果顯示四位青少年及其家長均認為是次課程對他們各方面的發展皆有所裨益。

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