

Using Film Study to Teach Perspective Taking in High School Students with Autism and Other Social Cognition Challenges

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Abstract

This article provides a preliminary evaluation of outcomes for a group-therapeutic Film Study program designed by school-based mental health providers and a speech language pathologist to facilitate perspective-taking in seven high-school students with autism and other social cognition challenges. The Film Study program involved microanalysis of one film over the course of an academic year. Evaluation of outcomes were based on post-hoc qualitative analyses of Film Study lesson transcripts. Findings indicated that participants were more engaged and used more psychological state terms to describe characters' points of view by the end of the program. Thematic analysis of transcripts also identified a number of changes in participants' perspective taking behaviors over time, including improved ability to (a) focus on characters' perspectives as opposed to their own, (b) differentiate between thoughts and feelings, (c) engage in increasingly complex discussions of characters' points of view and (d) respond to and build on one another's comments. Results suggest that microanalysis of film may offer a promising means for school mental health providers to support adolescents with ASD to improve their perspective-taking skills through scaffolded practice.

Keywords: Autism spectrum disorder; High functioning autism; Asperger Syndrome; Film study; Social cognition; Perspective taking; Social and emotional understanding; Theory of mind

Introduction

Perspective taking refers to the process by which a person temporarily suspends his or her own point of view towards an object or event in order to assume another person's point of view [1]. This can occur visually, by imagining what something looks like from another's physical location, or cognitively, by imagining another's mental point of view. Cognitive perspective taking is closely related to "theory of mind" (ToM), which enables an individual to grasp that he/she has thoughts and emotions, that others have thoughts and emotions, and that one's own and others' thoughts and emotions may differ significantly [2].

For most children, perspective taking or ToM skills develop organically, and as a natural outgrowth of interacting with others. Selman and Byrne [3] have posited a multi-leveled framework to describe the process by which typically developing children spontaneously develop an increasingly sophisticated capacity for assuming others' mental perspectives. According to Selman and Byrne, the most basic developmental level is that of "egocentric role taking" which does not distinguish between the child's own and others' points of view. However, in response to his or her ongoing exposure to social experiences, the typically developing child naturally (1) comes to understand that others feel and think differently because they are in different situations or have access to different information (i.e., "subjective role taking"), (2) learns to reflect on his or her own behavior and motivation as seen from another's point of view (i.e., "self-reflective role taking"), and (3) is ultimately able to integrate both his or her own point of view and the point of view of another person so

that both perspectives can be considered simultaneously (i.e., "mutual role taking"). This learned ability to engage in complex perspective taking appears to play a critical role in the success of social interactions, including cooperative play, reciprocal conversation, and demonstrating empathy [4].

One of the hallmarks of autism spectrum disorders (ASD), however, is difficulty assuming others' perspectives [5]. Although individuals with ASD are often able to pass "first-order" ToM tests (i.e., which require participants to predict a second person's behavior based on the person's thoughts/feelings), more complex "second order" ToM tests (i.e., which require participants to predict what a third person thinks about what a second person thinks), usually remain an ongoing challenge for this population [5]. Further, although individuals with higher functioning ASD can often figure out how to pass relatively static ToM tests, or tests that include input from only one channel (e.g., visual versus auditory input), they continue to struggle with tests like 'Reading the Mind in Films' which require participants to interpret context-rich and ecologically valid scenes from movies [6].

Why is this? Klin et al. [7] argue that the inability to intuitively make sense of social contexts, and to interpret dynamic, rapidly-changing social cues requiring second-by-second integration of both verbal and visual input, is at the very core of ASD. According to Klin et al. [7] human development is the product of a dialogic process wherein the brain, or what Klin et al. [7] refer to as the "enactive mind," not only sets out to make sense of the surrounding social world, but is continually transformed as a result of this brain/world interaction. This ongoing transformation means that we are continually expanding the cognitive "network of experiences" that we can draw upon when navigating new social situations.

Individuals with ASD, however, who seem to lack a native capacity to focus on the most salient features within their social environments,

miss out on these critical opportunities for ongoing social cognitive development—including the development of perspective taking. As Selman & Byrne note, typical development of perspective taking skills is dependent upon our taking advantage of the many opportunities we have to participate in naturally occurring social interactions, in other words to practice taking others' points of view. Vermeulen suggests that one of the ways of jump-starting this important dialogic process between the brain of the child with ASD and his or her surrounding social world, is to prime them to attend to the most important social context clues [8]. Klin et al. [7] argue that because this sort of primed practicing of perspective taking or "mind reading" results in the actual rewiring of the brain's neurological circuits, it may ultimately result in the improved capacity of individuals with ASD to make sense of social contexts.

Teaching perspective taking to students with ASD

In spite of what seems a clear need for providing meaningful opportunities for students with ASD to develop their perspective taking skills, outcomes from intervention research in this area are for the most part discouraging. A small but significant body of literature on teaching perspective taking and/or ToM skills to children with ASD finds that while children's scores on ToM tests often seem to improve following direct instruction, as does their conceptual grasp of ToM, the ability to pass these narrowly focused tests does not result in the generalization of these skills to more naturalistic social settings. For example, a randomized control trial measuring the effectiveness of a ToM training procedure found that while participating children demonstrated significant gains in ToM tasks, training did not affect their emotion recognition skills or their daily life [9]. Another controlled study by Golan and Baron-Cohen [10] found that training participants with ASD to recognize emotions and mental states using a computer program improved performance on the types of measures used during training, but did not generalize to mind reading tasks that were not used during training. A third randomized controlled study by Begeer et al. [11] found that ToM treatment of children resulted in improved conceptual ToM skills, but that neither participants nor their parents observed any significant changes in actual social behaviors. Results from each of these studies reinforce the notion that teaching to the test, while effective in helping participants with ASD master ToM test-taking, does not seem to result in broader and more meaningful perspective taking gains.

Film as a tool for developing empathy and perspective taking

Over the past few decades, the study of film and video footage has increasingly been used for teaching empathy, perspective taking, and other skills related to social and emotional learning. Video-based instruction has successfully been employed with a variety of populations, ranging from K-12 students to university students, typically developing students to students with significant social cognitive deficits.

Both instructors and students find film to be an entertaining and highly engaging medium for content delivery, and an effective means of supplementing—if not replacing altogether—more didactic approaches to instruction such as lecturing and giving verbal instructions. For example, a number of articles, including several research studies, have explored the impact of film study on the social and emotional understanding of undergraduate and graduate students preparing for careers in a variety of helping professions. These articles have explored the impact of film study on nursing students' abilities to

relate to patients' experiences of physical pain [12]; medical residents' empathy and altruism [13]; novice teachers' understanding of gifted students' unique needs [14]; and therapy/counseling students' abilities to connect to their clients [15]. Furthermore, articles frequently mention the importance of film study for forging deeper, more meaningful connections between instructors and their students, as well as among students themselves [12].

A number of articles have also described and/or measured the value of film and video for supporting social and emotional understanding in students with disabilities, including ASD. A few have involved the viewing and discussion of films or television programs [16-18]. For example, in a study of 109 boys diagnosed with emotional disturbance, Elias [19] found that television-based social problem solving resulted in improved emotional regulation and peer acceptance. Similarly, a case study by Breen [20] suggested that the therapeutic use of soap operas for a teenaged boy with ASD resulted in enhanced social relatedness. Finally, Vagin [21] recently published a book describing movie viewing as a means of nurturing a wide range of social cognitive skills in children with autism. Research documenting the effectiveness of these approaches, however, is extremely limited, and studies rarely provide information on interventions detailed enough to enable replication.

We hypothesize that given the similarity between the processing of cinematic representations of social contexts and actual social contexts, with the primary difference being the possibility of pausing films to analyze the flow of social interactions and their meanings, guided Film Study that engages students with ASD in scene-by-scene microanalysis may offer a promising means of facilitating improvements in ToM and perspective taking skills.

In response to (1) the critical need for developing perspective taking skills in students with ASD, (2) the failure of most studies to show that teaching students to pass narrowly constructed ToM tests results in their ability to assume others' perspectives in more naturalistic social contexts, and (3) the promise of film study for improving empathy and social understanding in other populations, two school mental health specialists (including the second author) and a speech language pathologist devised a Film Study program designed to facilitate improved perspective taking in a group of high-school students with ASD via in-depth microanalysis of popular films.

Commonly used in the fields of social psychology, linguistics, sociology, and communications, microanalysis offers a unique approach to studying and interpreting film segments, as well as a distinctive way of thinking about communication more broadly [22]. Just as the microscope enables biologists to examine and dissect animals and plants in fine detail, the videorecorder allows us to hone in on the subtle nuances of communication by breaking film or other video footage down into brief segments or even single frames. One of the key features of a microanalytic approach is a commitment to studying communication as it actually occurs [22]. Film Study allows students with ASD to assume the role of microanalysts, slowing down the filmic interactions depicted in order to examine the subtleties of characters' feelings, thoughts, and reactions that would otherwise likely be too rapid and complex for them to grasp in real time. As Klin et al. [7] state, "We would be overwhelmed and paralyzed by [the world's] richness if we were to start from a position of equal salience to every aspect of what is available to be visually inspected." A microanalytic approach to Film Study creates a sheltered environment within which high-school students with ASD can engage in guided practice attending to those features of a given movie scene that are most

socially salient. We propose that this type of scaffolded practice reading the minds of movie characters as they engage in authentic onscreen social interactions has potential to translate into improved perspective taking skills in the real world in a way that simply mastering decontextualized ToM tasks does not.

The purpose of this article is to describe the results of a small-scale, qualitative pilot study designed to provide preliminary evaluation of Film Study outcomes. Authors asked the following research questions: (1) Did Film Study result in higher levels of engagement by participants in group discussions over time (as measured by mean numbers of turns taken and words spoken)? (2) Did Film Study participants' use of psychological state terms (i.e., language referencing characters' thoughts and feelings) increase over time? (3) Based on thematic analysis of Film Study transcripts, what did participants perspective taking behaviors look like, and did their perspective taking behaviors change over time?

Method

Participants

Eligible participants included all students currently attending a suburban, non-public high school program serving students with ASD and other social cognition challenges. Nine students met the following eligibility criteria: (1) 14-18 years old; (2) formal diagnosis of ASD and/or significant impairments in social cognition as determined by independent neuropsychological evaluation; (3) average to above average intelligence quotient (IQ); and (4) adequate expressive and receptive language skills for engaging in meaningful discussions about films. Although we were able to secure informed consent/assent from all nine eligible students, only seven remained enrolled in Film Study for the duration of the program.

These seven participants ranged from 14.1 to 17.3 years of age at the beginning of the pilot study (see Table 1). Five were male and two were female. Educational records—specifically participants' most recent neuropsychological evaluations, based on the DSM-IV—documented diagnoses of ASD, Asperger Syndrome, or pervasive developmental disorder-not otherwise specified (PDD-NOS) for six (some with comorbid diagnoses of attention deficit hyperactivity disorder [ADHD] or anxiety disorder), and one with a combination of cognitive disorder-NOS and anxiety disorder. In terms of levels of cognitive functioning, participants' educational records indicated that six were classified as having normal full-scale intelligence quotients (FSIQ) using the Wechsler Intelligence Scale for Children-IV (WISC-IV), with one participant in the "borderline" range (i.e., 70-79), three in the "low average" range (i.e., 80-89), and two in the "average" range (i.e., 90-109). FSIQ scores were unavailable for the seventh participant due to wide variation in his WISC-IV sub-test scores (i.e., a Perceptual Reasoning Index score of 57 and a Verbal Comprehension Index score of 95).

From the outset, the seven students demonstrated varying degrees of readiness for Film Study. Two students (a female and a male) were leaders in their enthusiasm, their understanding of the film, and their expressiveness. A third student (a male) demonstrated comparable understanding but was less consistent in his participation. Two more students (a female and a male) were eager to participate but sometimes struggled to understand the plot of the film and the perspective-taking questions being asked. The two remaining students (both male) required prompting to participate and tended initially to seek answers

to the questions in the most immediate cues available (i.e., the last thing someone said or the paused image of the film on the screen).

Participant ID	Gender	Age at Time of Intervention	Diagnosis	FSIQ
P1	M	14.1	Cognitive Disorder-NOS/Anxiety Disorder	89
P2	M	14.2	ASD/Anxiety Disorder	94
P3	F	16.4	Asperger Syndrome/ADHD	70
P4	M	14.1	ASD	85
P5	M	16.2	PDD-NOS	88
P6	M	14.5	Asperger Syndrome	N/A
P7	F	17.3	ASD/ADHD	109

Table 1: Participant characteristics.

Description of "Film Study" program intervention

The purpose of Film Study is to use the microanalysis of one film over the course of an academic year as a means of providing opportunities for students with ASD or other social cognition challenges to practice perspective taking. Students are prompted to interpret characters' points of view as they watch the film. The film is paused frequently—sometimes within seconds—to allow for microanalysis of characters' dialogue, facial expressions, and body language in light of the interpersonal and sociocultural contexts portrayed in the film narrative.

Films are selected to meet a few basic criteria: First, they must be live-action movies with humans as the main characters, because facial expressions and body language are key focuses of analysis. Second, the characters' social interactions must be realistic, so that we can interpret them as we would in real life. The setting or circumstances may be fantastic but with recognizable elements of reality (e.g., *Back to the Future*). Third, the films must be non-violent. Many of the films selected for Film Study have featured children or teenagers, because students seem to more readily relate to characters their own age.

For each film, an instructors' guide is created by the mental health professionals leading the class. The guide indicates when to pause and what questions to ask during each lesson. In other words, there is no generic curriculum. The questions are driven by events in the film itself. However, the following types of microanalytic questions and question-strategies are frequently used:

- Thought and feeling bubbles are drawn around close-ups or mid-shots of the characters. Students are asked to name what the characters are thinking and feeling.
- Turning off the dialogue is sometimes done to ask students to make interpretations solely on the basis of nonverbal cues.
- Changing the tone of the dialogue is practiced to highlight the function of vocal intonation. Students are asked to deliver a character's line with various intonations to convey various meanings.
- Subtexts of the dialogue are identified. Students are asked to think about meanings that are not conveyed directly by what the characters say.

- Character motivations are identified. Students are asked what the characters' intentions might be during specific moments of action and dialogue.
- Character knowledge is identified. Students are asked what each character knows as compared with what we in the audience know.
- Context is considered. Students are asked to link characters' interactions to: (a) the type of relationships involved; (b) cultural context; and (c) historical context.

As mentioned above, the questions used to prompt microanalysis are inspired by events in the film. The narrative of the film provides the scope and sequence of the curriculum. As a film progresses, the unfolding of the plot and the development of the characters tend to allow for increasingly complex and sophisticated analyses. Questions address characters' psychological states, the nature of their relationships, and the influences within their social environments. Discussion often consists of a debate about characters' motivations and the alternative choices they might have made. Multiple interpretations are encouraged, and it is frequently acknowledged that there is (a) no single answer and (b) always some guesswork in social cognition.

For the purposes of this study, the film used was *It's Kind of a Funny Story*, about a teenager who checks himself into a mental ward, and the lessons he learns from his relationships with other patients and hospital staff. Film Study sessions were 45 minutes in length, and took place once per week for a total of 24 weeks in participants' high-school classroom. The intervention team included the participants' two school mental health providers (including the second author), and speech language pathologist.

Study design

Design of this pilot study included a combination of three post-hoc qualitative analyses of Film Study class transcripts. These analyses were used to determine whether there were any significant changes over time in 1) participants' engagement levels (i.e., as measured by frequency and length of turns), 2) use of psychological state terms to talk about movie characters' thoughts and feelings (i.e., as measured by total number of psychological state terms used), and 3) perspective taking behaviors (i.e., as measured by thematic analysis of participants' comments about movie characters' points of view). In designing this study, we sought to meet all of the credibility indicators for qualitative research, including methodological and investigator triangulation, researcher reflexivity, disconfirming evidence, collaborative work, and prolonged field engagement [23].

Data collection

All 24 sessions were videotaped and transcribed verbatim by the first author. The first five sessions and last five sessions were then selected to represent participants' "beginning of program" (or baseline) and "end of program" performance and/or patterns of interaction. Unintelligible utterances were excluded from the analyses.

Data analysis

Engagement. Authors counted total number of turns taken and total number of words spoken per participant per lesson in order to measure any changes in engagement between the beginning and the end of the program. Differences in mean totals for each were calculated using a series of t-tests for paired samples. Differences were found to

be significant at the 0.05 level. Effect sizes were calculated using Cohen's *d*.

Use of psychological state terms. Using a codebook especially created for the purposes of this study (i.e., based on a review of transcripts), authors counted the total number of psychological state terms used per participant per lesson to determine whether there was an increase over time in the attribution of psychological states to characters. Because the focus of this study was on participants' perspective taking skills, psychological state terms used to reference participants' own or others' (i.e., non-characters') points of view were not included in the analysis. In creating our codebook, authors adapted Tager-Flusberg's [24] definition of psychological state terms to include any adjectives, adverbs, nouns or verbs that explicitly referenced desire (e.g., "want," "hope"), emotion (e.g., "sad," "anxious") or cognition (e.g., "think," "know"). We also added a fourth category for what we termed second-order ToM terms that included any verbs used to reference a character's behavior that implied awareness of and/or intent to impact another character's psychological state (e.g., "persuade," "comfort"). Differences in mean totals for each were calculated using a series of t-tests for paired samples. Differences were found to be significant at the 0.05 level. Effect sizes were calculated using Cohen's *d*. Inter-rater reliability was assessed by having the second author code a random sample of each of the 10 transcripts being analyzed for use of psychological state terms to describe characters' points of view (i.e., at least 20% of the five transcripts from the beginning of the program and 20% of those from the end of the program). Inter-rater reliability was calculated by dividing the total number of agreements between the authors by the total number of agreements plus the total number of disagreements between the two authors, and multiplying by 100. Inter-rater reliability was 89%.

Thematic analysis of participants' perspective taking behaviors. Analysis of participants' perspective taking behaviors took place in several phases and was conducted systematically using methods described by Miles and Huberman [25]. Initially, the first and second authors independently engaged in data reduction by reviewing transcripts of Film Study lessons and labeling/coding examples of discourse patterns observed at the beginning and end of the program that pertained to evidence of perspective taking (e.g., referencing characters' thoughts, referencing characters' feelings, using characters' perspectives to explain motivations and/or meaning of plot). Authors met to discuss and consolidate findings and establish a coding tree. Any differences of opinion were resolved by returning to the data and establishing, via consensus, what the data were actually "saying." The first author then went back and coded all transcripts accordingly, making minor modifications to the coding tree as needed. A third and final layer of analysis was intended to generate an explanatory framework for study findings. Whereas the first two phases were mainly descriptive in nature, and focused solely on the data, this final step (see Discussion) integrated ideas from the literature on the development of perspective taking in typically developing children and theory of mind deficits in children with ASD.

In an effort to be transparent, authors felt it was important to self-disclose the following information about our potential biases: Both authors were inclined to believe that the Film Study program would have a positive impact on students, and were partial to the notion that microanalysis of movies would be highly motivating as well as effective in creating non-aversive opportunities for students to practice perspective taking. The second author was also one of the clinicians involved in designing and implementing the Film Study program.

Size	Baseline counts		End-of-year counts		Difference		t stat	Effect
	Mean	SD	Mean	SD	Mean	SD		
Mean Number of Turns	12.35	(6.49)	18.18	(8.47)	5.82	(4.97)	3.10*	0.83
Mean Number of Words	132.44	(112.3)	201.36	(114.36)	68.92	(54.46)	3.35*	0.66
Mean Number of Psychological State Terms Used	3.84	(2.83)	7.56	(3.85)	3.72	(3.85)	2.56*	1.19

*p<0.05

Table 2: Changes Over Time in Participants’ Mean Number of Turns, Words, and Use of Psychological State Terms to Describe Characters’ Points of View.

Findings

Engagement

Based on a comparison of beginning-of-program and end-of-program transcripts, participants demonstrated significant growth in the number of turns taken, with a mean of 12.35 turns per person/per session at the beginning of the program (range=7.3 to 25.4) and a mean of 18.18 turns per participant/per session at the end of the program (range=7.3 to 32.0) (Table 2). Growth was observed for six participants, but performance remained static over time for the seventh. Participants also demonstrated significant growth in the number of words spoken, with a mean of 132.44 words per participant/per session at the beginning of the program (range=31.7 to 349.4) and a mean of 201.36 words per participant/per session at the end of the program (range=33.5 to 356.6). Growth was observed for all seven participants. Effect size based on Cohen’s d was above 0.80 for mean number of turns, and was therefore classified as large. Effect size for mean number of words was 0.66, and was therefore classified as medium.

Use of psychological state terms

Based on a comparison of beginning- and end-of-program transcripts, participants demonstrated significant growth in the number of psychological state terms used to describe characters’ points of view, with a mean of 3.84 terms used per participant/per session at beginning of the year (range=0.6 to 8.8), and a mean of 7.56 terms used per participant/per session at the end of the program (range=1.00 to 11.67) (Table 2).

Growth was observed for six participants, and one participant regressed very slightly from an average of 1.7 to an average of 1.0 terms per lesson. Effect size for mean number of psychological state terms describing characters’ points of view was 1.19, and was therefore classified as very large.

Thematic analysis of participants’ perspective taking behaviors

Thematic analysis of beginning-of-program and end-of-program Film Study transcripts revealed four key shifts in discourse patterns over time in terms of how participants engaged in perspective taking. Although these shifts were not “absolute” (i.e., not all participants demonstrated all types of shifts over time), shifts represented significant changes overall in the way participants were able to take others’ perspectives.

Own vs. others’ points of view. The first trend we noted was participants’ shift over time from perseverating on their own points of view to an increasing ability to entertain others’ points of view. The following is a typical example of baseline discourse, and the inability of participants to focus on the movie characters’ points of view as opposed to their own thoughts/feelings about what was happening onscreen:

Ther:Let’s give the doctor a thought bubble. What’s going on his mind? What does he see in Craig?

P1:He went to the wrong place at the wrong time. Before he woke up on that dream, before you immediately go to the hospital, you should just at least think about your feelings, about your feelings first before you make a decision, because they’re doctors not psychologists. He doesn’t deal with feelings. And he can’t even, he can’t give medication, and all he can do is contact his parents and see if everything’s okay. Because as a minor, and he may not know his own feelings, but he just didn’t – you know how you get yourself into a social situation, where you get yourself into the wrong situation at the wrong time. Peer pressure and stuff like that?

Ther:Did you just describe your thoughts or what the doctor thinks?

P1:My thoughts.

By end-of-year, however, participants were readily able respond to therapists’ requests for them to assume movie characters’ points of view. For example:

Ther:Bobby’s thought bubble?

P1:“Go, dude!”

P2:“You did it!”

P3:“You did it at last! Be proud of yourself!”

Ther:When you’re saying, “You did it!” who’s he thinking of?

All:Craig!

P3:Craig. He’s happy for Craig. “You did it, young boy. You’re now officially a gentleman!”

Differentiating between thoughts and feelings. The second trend we noted had to do with differentiating between characters’ thoughts and feelings. At the beginning of the program, participants frequently identified characters’ thoughts when asked to identify their feelings. For example:

Ther:Name that feeling!

P1:He's thinking, "Um, he's not really normal." He's like, "Why is this guy talking to me?"

Ther:So what would the emotion under that be?

P1:I don't know, kind of uncomfortable?

By the end of the program, however, participants were no longer confusing thoughts with feelings. For example:

Ther:So what kind of feeling might he have if this is what he sees Craig doing?

P1:Sadness.

Ther:Maybe sadness.

P1:Sadness. Kind of anger because he's not trying.

Answering increasingly complex point of view questions. The third trend we noted had to do with changes in participants' abilities over time to answer increasingly complex questions pertaining to characters' points of view. Most commonly, this meant answering static, "in the moment" types of questions at the beginning of the program (e.g., "What is such-and-such character feeling/thinking right now?"), to managing more dynamic point of view questions that required summing up changes in characters' perspectives over time, or reflecting on how one character is reacting to what he/she knows about another character's thoughts/feelings. For example, at the beginning of the year, participants most frequently answered questions like this:

Ther:What is the doctor thinking about Craig? In this moment what is the look on his face?

P1:He says, "I've never seen these types of illnesses before," probably.

P2:He's kind of like, "Maybe I should check this guy to see if he's safe."

P3:"Why am I doing this? This is a waste of my time."

Ther:Interesting – a lot of different interpretations of what's going on.

By the end of the program, however, participants were able to confidently answer questions more like this:

Ther:But the difference between today and last Saturday is?

P1:He feels better.

P2:He feels less anxious and more confident about his future.

P1:I think he wanted to thank Bobby for all his help.

P3:He has an idea of trying... he thought that he's in a good environment. He's like calmer now and he learned, all of the people taught him stuff, and they basically taught him, "You don't have to be afraid."

Significantly, even though the therapist did not specifically request that participants reflect on the characters' thoughts and feelings, several participants referenced them anyway in an effort to answer the therapist's question about changes in Craig's character over the course of his week in the mental hospital.

Frustration with peers' points of view vs. building on each other's responses. Finally, the fourth trend we noted had to do with the way in which participants related to one another. Over time, they appeared to shift from ignoring each other's responses and getting frustrated with each other when their peers' points of view differed from their own

points of view, to referencing one another's responses and even building on one another's ideas. For example, at the beginning of the year, participants directed almost all of their comments to the therapists, and there was so much discord between participants, that one of the therapists had to explain that multiple perspectives were welcome. By the end of the year, however, participants were not only tolerating one another's points of view, they were co-constructing responses. For example:

Ther:So how does it happen that he did it so well in the previous scene with her, and now he's having such a hard time?

P1:This was the first time they're making out, so they're both very nervous with each other, because they're about to be very intimate.

Ther:Ah! They anticipate being intimate, and so they're kind of nervous with each other. Huh. So did Craig have to be perfect in his way of asking her out?

All:No!

Ther:Why not?

P1:You just have to say it in a way that makes her feel good.

P2:And that the other person understands...

P1:...what they're saying.

Ther:Wow! What a cool answer.

Discussion

Qualitative analyses of Film Study transcripts suggest that participants in the Film Study program found it to be engaging, and seem to have improved in terms of their perspective taking skills—at least within the context of Film Study class. Not only did participants appear to be more engaged over time (as measured by overall number of turns and length of utterances), but also to use more frequent and more varied psychological state terms to reference characters' points of view. Further, based on thematic analysis of transcripts, participants appeared to be more likely by the end of the year to assume movie characters' increasingly complex points of view, and to co-construct responses to therapists' questions that recognized and built on peers' comments in surprisingly pro-social ways.

The authors originally hypothesized that the microanalysis of a film would provide participants with plentiful opportunities to practice reading social situations and interpreting others' thoughts and feelings, which in turn would lead to improved skills in this area. Not only did this appear to be the case, but the narrative arc of the film seemed to naturally lend itself to the scaffolding of increasingly more sophisticated perspective taking over time. In other words, at the beginning of the film, participants focused on reading characters' facial expressions and body language, and identifying their thoughts and feelings (i.e., "first order" ToM tasks) within the movie's relatively static introductory scenes. Over the course of the year, however, as participants began making sense of scenes unfolding and characters developing over time and in relation to one another, participants began to reflect on how characters' thoughts/feelings evolved, and how relationships between characters (i.e., "second order" ToM tasks) contributed to the overall meaning of the film. Unlike more traditional uses of film in therapeutic contexts (i.e., which require clients to watch a film in a single sitting and reflect on it during the following therapeutic session), microanalysis of a film over the course of a program-year seemed to both mirror and support participants' gradual

skill acquisition, and ability to answer increasingly complex, multi-faceted questions about characters' motivations and mental states vis a vis one another. Preliminary Film Study outcomes also seemed to validate Selman and Byrne's [3] developmental framework, with participants moving from "egocentric role taking" (or preoccupation with their own thoughts/feelings), to "subjective role taking" (or the ability to entertain characters/peers' thoughts/feelings, even when different from their own).

Another reason for the apparent success of Film Study in supporting participants' perspective taking skills may relate to Klin and colleagues' [7] concept of the "enactive mind" and Vermeulen's [8] recognition of the importance of "priming" individuals with ASD to attend to context cues. After a year of facilitated practice assuming the perspectives of others, and thinking about the relationships between characters' thoughts and feelings and the development of plot, participants were more likely to (1) reference characters' states of mind as a means of explaining various plot devices (e.g., "X seemed worried because he knew Y felt bad, and he wanted to make Y feel better") and (2) reference one another's comments when making their own (e.g., "I agree with what X said," or "Just like Y said, I think ..."). These apparent changes in discourse patterns over time suggest that practice engaging in perspective taking tasks (and thereby nurturing the "enactive mind," or activating the dialogic process whereby the brain learns and grows in response to interacting with the world) may really contribute to participants' improved abilities to make sense of social context.

It is important to note, however, that outcomes varied considerably from participant to participant. A few entered the program with relatively strong perspective taking skills, whereas others entered the program with minimal skills in this area. Further, not all participants demonstrated growth over time across all areas, and some continued to struggle with accurate and/or spontaneous reading of characters' thoughts and feelings. We hypothesize that one of the reasons Film Study class seemed to result in positive (albeit somewhat different) outcomes for everyone was because more capable participants were able to model effective perspective taking behaviors for less capable participants. Although we did not originally set out to examine changes in the way participants' interacted with one another over time, we were pleased to find that in addition to improved ability to assume movie characters' points of view, transcript analysis revealed clear trends towards a more interactive and co-constructive group therapeutic dynamic.

A second hypothesis had to do with the fact that instructors met together prior to each week's lesson to develop a teachers' guide, creating an opportunity for them to discuss the strengths and needs of each participant, and to identify the levels of scaffolding each would require in order to participate at his/her highest possible level.

Limitations

Findings from this study should be interpreted with the following limitations in mind: First the sample size was small, and statistical analyses are always more robust when samples are larger. However, de Winter [26] compellingly argues that paired t-tests can be feasible with small Ns, especially if the within pair correlation is high (as it was for this study). Second, because authors were unable to secure a control group, and students participating in Film Study received other interventions that may have impacted their social and emotional awareness and perspective taking skills (although Film Study was the

only part of their curriculum that explicitly addressed these skills), we should be cautious about drawing any causal links between Film Study and changes in participants' discourse patterns over time. Third, because the entire study was based on the post hoc analysis of Film Study transcripts, we were unable to assess whether or not the apparent improvements in participants' perspective taking skills generalized to contexts outside of Film Study. Fourth, the second author was also involved in developing and implementing the Film Study program. Although coding was conducted independently by the first and second authors and a codebook was carefully followed to ensure objectivity, the possibility of bias remained. This is a necessary challenge of school-based research, where the roles of curriculum developers, interventionists, and researchers often overlap. Finally, Bellini et al. [27] recommend the manualization of school-based social skills curricula like Film Study in order to ensure both fidelity of implementation and replicability across instructional contexts. Film Study has not been manualized. In fact, because therapists' guides are developed in response to the specific events of each film, and generated by therapists prior to each lesson to meet the needs of students, manualization would be difficult. That said, the developers of Film Study are in the process of creating therapists' guides for each of the films they have used thus far with students, and these guides could potentially be tested across multiple settings [28-35].

Concluding Remarks

Group therapeutic Film Study offers an innovative and motivating means of getting high school students with ASD and other social cognition challenges to engage in perspective taking exercises. Further, this pilot study suggests that the microanalysis of film may offer a promising means of improving students' ability to consider others' points of view. Results of our pilot study, combined with the program's novel approach, suggest that additional investigation through a more controlled experimental study with a larger number of participants is warranted.

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