

Clinical Exchange

“Do I Know What I Need to Do?” A Social Communication Intervention for Children With Complex Clinical Profiles

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The ability to manage social situations is a critical skill to teach and support in school-age children (Prelock, 2002). Indeed, the American Speech-Language-Hearing Association (ASHA) has identified the enhancement of “problem solving, social communication and coping skills” as one of the responsibilities of the school-based speech-language pathologist (ASHA, 2000, p. 278). The challenge for speech-language pathologists is that children exhibiting social communication difficulties present with complex clinical profiles and diverse etiologies. To effect change, interventions must address the multiple deficits that may be impacting a child’s social communication skills (Gresham, Sugai, & Horner, 2001).

The purpose of this clinical exchange is to present a feasibility study addressing the complex clinical profile of a school-age youngster with compromised social communication skills and significant prenatal alcohol exposure leading to diagnosis of a fetal alcohol spectrum disorder (FASD).¹ The goal of a feasibility study is to determine the clinical viability of an untested intervention and whether

¹The National Organization on Fetal Alcohol Syndrome (NOFAS) recently adopted the term “fetal alcohol spectrum disorders” (FASD). FASD is an umbrella term describing the broad range of effects that can occur in an individual whose mother drank alcohol during pregnancy. These effects may include physical, mental, behavioral, and/or learning disabilities with possible lifelong implications. (NOFAS, 2004).

ABSTRACT: Purpose: Speech-language pathologists frequently address social communication difficulties in children with diverse clinical profiles. The purpose of this study was to investigate the feasibility of a social communication intervention for a school-age child with a complex cognitive and behavioral profile secondary to diagnosis of a fetal alcohol spectrum disorder.

Method: A case study is presented to describe the implementation of the intervention targeting mental state verb production and social cognitive skills. The intervention included group role play of social scripts and a checklist to elicit the participant’s statements about others’ perspectives and strategies for completing the social script. Treatment data monitored the participant’s responses to the checklist questions. Probe sessions, consisting of theory of mind false

belief tasks, were used to examine mental state verb use.

Results: Treatment data demonstrated that the participant stated more strategies in response to checklist questions. The participant did not produce any mental state verbs during baseline probes, but did produce mental state verbs during the treatment phase.

Clinical Implications: The results support use of this intervention to change children’s linguistic and social cognitive skills. Suggestions for extending this intervention to include a generalization plan targeting classroom social communication interactions are provided.

KEY WORDS: social communication, intervention, fetal alcohol spectrum disorder, elementary students

further investigation is warranted (Gillam, 2003). In the present study, the feasibility of both the intervention and the measures used to document change are explored.

The clinical hypotheses investigated within the intervention were informed by research literature in social communication and social behaviors in children with FASD and social communication intervention studies conducted with other clinical populations.

SOCIAL COMMUNICATION AND SOCIAL BEHAVIORS IN CHILDREN WITH FASD

A growing body of evidence reveals that high levels of prenatal alcohol exposure can interfere with brain development and cause an intricate array of disabilities. One of the most compromised developmental domains in this clinical population, and one of critical importance to speech-language pathologists, is social communication (Olson, Morse, & Huffine, 1998; Coggins, Olswang, Olson, & Timler, 2003; Streissguth, Barr, Kogan, & Bookstein, 1996; Thomas, Kelly, Mattson, & Riley, 1998). Substantial difficulties providing sufficient information to communicative partners in both narratives and conversational tasks have been documented in children with FASD (Coggins, Friet, & Morgan, 1998; Hamilton, 1981). Caregivers consistently report that their children fail to take into account the perspectives of other people during conversations (Timler, 2000; Timler & Olswang, 2001). Further, affected children frequently fail to use their language to adequately describe what others may think or know about a situation, show poor cause-and-effect reasoning, and seem unaware of the consequences of their actions (Streissguth et al., 1996). Elsewhere, it has been argued that impaired social communication in this population of children results from disruptions in linguistic behaviors; underlying social cognitive behaviors; and higher order executive functions such as memory, attention, and planning (Coggins et al., 2003).

Descriptions of children's failure to account for another's intentions or feelings have led to the intriguing speculation that children with FASD may have a deficit in "theory of mind." Theory of mind represents the ability to infer the mental state of others, that is, to interpret and predict another's knowledge, intentions, beliefs, emotions, and desires, especially when this knowledge may differ from the child's own knowledge (Baron-Cohen, 1989). Diverse explanations have been proposed to account for the fundamental changes in children's thinking that enable them to infer another's beliefs and desires (see Astington, Harris, & Olson, 1988; Hale & Tager-Flusberg, 2003; and Lohmann & Tomasello, 2003). Baron-Cohen and Howlin (1993) suggested that theory of mind deficits have far-reaching and devastating effects during everyday social interactions, including limiting one's ability to be sensitive to and anticipate another's intentions and desires as well as to interpret the motivation behind those intentions and desires. Supporting this view, Frith, Happe, and Siddons (1994) discovered that children with autism who passed theory of mind tasks demonstrated sensitivity toward others in such

everyday tasks as choosing an appropriate present for someone else and responding to indirect cues in conversation. As such, theory of mind may be an important component for developing appropriate social communication skills.

Clinical tasks that are used to assess children's theory of mind typically consist of false belief scenarios whereby a child must discount personal knowledge to accurately infer what another person knows about a situation. In other words, a child must predict that a person's behavior is dependent on what that person thinks or knows even when that belief is false (de Villiers & de Villiers, 2000). For older school-age children, the complexity of false belief tasks is increased by both memory demands and embedded linguistic constructions (see Silliman et al., 2003, for a review of task construction). Interestingly, Coggins (1997) found that school-age children with FASD fail these complex higher order false belief tasks. Even when second-order false belief tasks are presented in a simplified format (i.e., use of memory prompts, simple sentences, and forced choice formats), children with FASD continue to have difficulty using their language to explain or justify their beliefs (Coggins, 1997; Koditwakku, May, Ballinger, Harris, Aase, & Aragon, 1997). This leads to speculation that theory of mind could be linked to the social communication problems that are exhibited by children who are affected by prenatal alcohol exposure.

SOCIAL COMMUNICATION INTERVENTION STUDIES

A sizable and instructive body of literature has accumulated from those who study and work with children exhibiting social communication deficits. Of interest here are two lines of intervention research: studies designed to improve children's performance on theory of mind tasks and studies designed to train specific social communication skills.

Theory of Mind Intervention Studies

Theory of mind false belief tasks have been used as intervention targets and intervention outcomes. Ozonoff and Miller (1995), for example, designed a social skills intervention for five adolescents with autism. The intervention attempted to teach both the ability to infer mental states and the ability to improve conversational skills (e.g., turn taking, topic continuation). When compared to children in a no-treatment control group, children in the training group demonstrated improved performance on false belief tasks, but minimal changes were observed on parent and teacher ratings of these children's social skills.

Video training and live enactment of false belief stories accompanied by modeling and corrective feedback have been used to teach children perspective taking and emotion/belief "reading" (Appleton & Reddy, 1996; Bell & Kirby, 2002; Hadwin, Baron-Cohen, Howlin, & Hill, 1996, 1997; Knoll & Charman, 2000; LeBlanc, Coates, Daneshvar, Charlop-Christy, Morris, & Lancaster, 2003; Melot &

Angeard, 2003). Following training, most children in these studies improved performance on similar false belief tasks. Hadwin et al. (1997) further investigated the potential effects of improved false belief task performance on children's communication skills; no changes were observed in conversational perspective-taking measures.

Recent studies have attempted to train specific syntactic structures while using theory of mind false belief task performance as an outcome measure. For example, Guajardo and Watson (2002) used interactive retelling of narratives followed by role play to highlight characters' thoughts and deception in published children's stories. Post-training results indicated that typically developing children improved performance on false belief tasks. Hale and Tager-Flusberg (2003) found that children who received training on the production of sentential complements (i.e., sentences consisting of a main and an embedded clause) demonstrated improved performance on both language measures and diverse false belief tasks. These findings add support to the hypothesis that language development, specifically the ability to produce sentential complements, "facilitates the development of a representational theory of mind" (Hale & Tager-Flusberg, 2003, p. 354).

The theory of mind studies reviewed here illustrate successful outcomes of interventions aimed at changing children's false belief performance. Improved false belief performance appears related to two particular linguistic skills: mental state verb use and complex sentence production (specifically, sentential complements). In fact, the relationship between false belief performance and linguistic competence is a consistently robust finding across a variety of theory of mind studies (Charman & Shmueli-Goetz, 1998; Hale & Tager-Flusberg, 2003; Happe, 1995; Leslie, 1992; Lohmann & Tomasello, 2003; Miller, 2004). Although it is intuitively appealing to link children's improved ability to "read" or state another's beliefs and desires with subsequent improvement in children's conversational perspective-taking and social communication skills, a direct relationship has not yet been demonstrated in theory of mind intervention research. Of course, many reasons could account for the lack of evidence, but three reasons seem most apparent. First, much of the theory of mind intervention research focuses on children with autism, who by definition have pervasive impairments in social interaction and communication skills. Second, the research has, for the most part, measured changes in social communication using teacher or parent rating scales that evaluate comprehensive performance. Perhaps, measures of more specific skills would better tap the changes that result from theory of mind intervention. Third, and finally, interventions have focused primarily on altering false belief performance. Undoubtedly, improving false belief task performance is a critical but certainly not sufficient target to effect comprehensive changes in children's social communication skills. In fact, effective interventions for changing social communication have targeted more specific social communication skills. The next section describes established components and procedures found in successful social communication interventions.

Social Communication Intervention Studies

A growing number of investigators have attempted to train specific social communication skills in school-age children. A review of this literature reveals that successful interventions have used direct skill instruction, modeling, and role play to allow children to establish and rehearse new skills during social problem-solving routines/scripts with peers (see Kamps, Kravits, & Ross, 2002; McFadyen-Ketchum & Dodge, 1998). In addition, self-management strategies (e.g., use of a social skills chart or checklist) are effective in improving generalization of newly learned behaviors (Koegel, Koegel, Hurley, & Frea, 1992), particularly when children practice these behaviors with peers (Kamps et al., 2002).

Selection of treatment targets for children who have problematic social communication requires a framework for viewing what typical children do when they approach social situations. We have found Crick and Dodge's (1994) model of social interaction particularly illuminating. This model accounts for the social cognitive skills that children perform as they appraise a social interaction, plan a response, and then evaluate that response. The model points to specific treatment targets for improvement of social communication skills. These targets include teaching children to state the problem or situation from both a "self" perspective and an "other" perspective (similar to demands expressed with theory of mind false belief tasks), generate a number of strategies to approach the situation, select and enact the best strategy, and then evaluate the consequences of the enacted strategy (for a review, see Kazdin & Weisz, 1998). Links between teaching these social cognitive skills and theory of mind performance as measured by false belief tasks have not been investigated directly. These social cognitive abilities, especially the ability to state a situation from another's perspective, require linguistic skills that are strikingly similar to those skills needed to pass false belief tasks. The logical connection between theory of mind and social communication, and specifically, the overlap between theory of mind false belief tasks and social cognitive skills, motivated the clinical hypotheses that provided the foundation for the multiple components and procedures detailed in this clinical exchange.

CLINICAL HYPOTHESES

The selection of intervention targets for this intervention reflects the multidimensional skills that are necessary to be a competent communicator in social situations. These targets addressed the linguistic skills that support theory of mind and the social cognitive skills that children employ when approaching a social situation. First, the intervention targeted mental state verb use (e.g., *think*, *know*, *guess*). This evaluative linguistic device was selected because children with high prenatal alcohol exposure have difficulty using mental states to reference another person's perspective, and effective use of these cognitive verbs is a critical measure of children's ability to represent a theory of mind. Second, the intervention targeted several of the social

cognitive skills proposed in the Crick and Dodge (1994) model, including generating a number of strategies and selecting the best strategy to resolve a social situation. To support growth of these social cognitive skills, a checklist was designed that provided the participant with a script for reflecting on and responding to social situations.

In summary, we hypothesized that participation in the intervention would change our participant's production of mental state verbs (e.g., *think, know, believe*) when stating another person's perspective, and social cognitive skills, when approaching a social situation, including the ability to (a) generate an increased number of alternative strategies to attain a social goal, and (b) select an appropriate strategy from these alternatives.

CASE STUDY

Participant Description

The study participant, Paula, was a girl (age 9;8, years:months) who was recruited from the University of Washington's Fetal Alcohol Syndrome Diagnostic Prevention Network Clinic. Paula exhibited key clinical features that are found among children with significant fetal alcohol exposure, including (a) a history of growth deficiency, (b) characteristic facial anomalies, (c) evidence of brain disfunction, and (d) conclusive and substantial evidence of teratogenic prenatal alcohol exposure (Astley & Clarren, 2000). She was diagnosed with an FASD at the age of 5 by an experienced dysmorphologist and interdisciplinary assessment team.

Birth and developmental history. Paula was the product of an 8½-month gestation and delivery by Caesarian section. At delivery, Paula's birth mother reported that she had a history of alcohol addiction and drank during her pregnancy "whenever I felt like it," even though she continued to participate in treatment for alcohol addiction before and after conceiving Paula. Paula's maternal grandparents had a history of alcoholism, and it was suspected that Paula's mother might have had an FASD herself. Paula's mother had special education needs and Paula's father was suspected to have learning problems as well. As a toddler, Paula lived in various homes with her mother, grandmother, and other family members. Paula's preschool health and educational history is largely unknown. Shortly before her fifth birthday, Paula and an older sister were removed from their home and placed with their current foster family.

At the time of the intervention, Paula had just completed third grade with resource support for most subjects. She had also received speech and language services with special emphasis on social skills during the previous school year. Paula had been living in her foster home for nearly 5 years. Paula's foster family included six children (one biological sibling, one adopted sibling, and three foster siblings) and two parents. Her foster mother conducted training for other foster parents and was well versed in community and school-based resources for children with FASD.

Assessment measures. Results of Paula's formal assessment are presented in Table 1. Paula's foster mother completed the Social Skills Rating System² (SSRS; Gresham & Elliott, 1990) and provided descriptions of Paula's social skills during a clinical interview. In addition, descriptive developmental assessment of Paula's pragmatic skills was completed.

Paula's performance on the Wechsler Intelligence Scale for Children-III (WISC-III; Wechsler, 1991) was in the borderline range. Individual subtest scores showed marked scatter, with relative difficulties in understanding of practical social knowledge and a relative strength in grasp of abstract verbal concepts. On verbal tasks, she frequently gave short answers that were wrong or vague and not necessarily on topic. She did not seem to reflect on her answers before giving them and did not elaborate responses to explain herself. She appeared to quickly decide what she was going to do and proceed, even when incorrect.

Paula's performance on the Comprehensive Assessment of Neuropsychological Development in Children³ (NEPSY; Korkman, Kirk, & Kemp, 1997) was in the low average or average range for the core domains of attention/executive function and language; however, she scored in the clinically deficient range in visuospatial processing and memory domains. Paula had particular difficulty with a narrative memory task. Even when cued, she often could not remember the information offered in the story, and at times her answers suggested that she could not comprehend cues offered to her.

Results from the parent-completed SSRS indicated that Paula had significantly fewer social skills and more problem behaviors than other girls her age. Paula's foster mother reported that Paula had a difficult time interacting with other children without calling them names and becoming aggressive. She did not have any "real" friends at school. In addition, the foster mother reported that Paula made "poor choices" when identifying "friends," usually selecting children who "tease her or make her cry."

Paula's performance on receptive and expressive language subtests from the Clinical Evaluation of Language Fundamentals-Third Edition (CELF-3; Semel, Wiig, & Secord, 1995) was in the low average range. Nonstandardized descriptive developmental assessment of Paula's pragmatic skills during a conversation with an adult indicated that Paula frequently changed topics abruptly and did not provide sufficient information to her listeners. Similar difficulties were noted in an informal clinical task in which Paula was asked to deliver "bad" news to a hypothetical friend (modeled after Bliss, 1992). For example, when asked to tell a friend that she did not get a part in a play, Paula stated, "I'm sorry you weren't in parts of it because it's over now."

²The parent edition of the SSRS is a 55-item rating scale of social skills and problem behaviors. Each item is rated using a 3-point scale (i.e., *never, sometimes, often*).

³The NEPSY, typically administered by psychologists, assesses attention, language, visuospatial processing, memory, and learning in children age 3 to 12 years.

Table 1. Paula's assessment information.

<i>Measure</i>	<i>Standard/scaled score</i>
Wechsler Intelligence Scale for Children–III (Wechsler, 1991)	(<i>M</i> = 100; <i>SD</i> = 15)
Verbal IQ	72
Performance IQ	81
Full Scale	75
Comprehensive Assessment of Neuropsychological Development in Children (Korkman, Kirk, & Kemp, 1997)	(<i>M</i> = 100; <i>SD</i> = 15)
Attention/Executive Function	85
Language	95
Visuospatial Processing	59
Memory	65
Clinical Evaluation of Language Fundamentals–Third Edition (Semel, Wiig, & Secord, 1995)	(<i>M</i> = 10; <i>SD</i> = 3)
Concepts & Directions	8
Word Classes	7
Formulated Sentences	5
Recalling Sentences	6
Social Skills Rating System (Gresham & Elliott, 1990)	(<i>M</i> = 100; <i>SD</i> = 15)
Social Skills	59
Problem Behaviors ^a	133

^aStandard scores for the SSRS Problem Behaviors subtest are based on an assessment of negative behaviors (i.e., higher scores on this subtest indicate more problem behaviors). Scores between 85–115 are considered to be within normal limits. Scores >130 indicate “substantially more problem behaviors than the average student in the standardization comparison group” (Gresham & Elliott, 1990, p. 51).

Clinical summary. Paula presents a complex cognitive and behavioral profile that is representative of children with an FASD. She shows a wide scatter of both strengths and weaknesses in her neuropsychological profile while demonstrating a relatively flat profile on standardized language assessment. Paula's difficulties in memory, documented on several standardized subtests, are likely also reflected in “real-time” social situations that are loaded with contextual and processing demands (Olswang, Coggins, & Timler, 2001). Indeed, Paula demonstrated deficient pragmatic skills during conversational and informal clinical tasks. Finally, Paula's social skills and problem behaviors are an area of grave concern for her foster mother.

Social Communication Intervention

Intervention schedule. Paula was enrolled in the social communication intervention with 2 peers. Her peers were 2 school-age children, a boy and a girl, who also had histories of prenatal alcohol exposure and subsequent diagnosis of an FASD. The actual intervention was conducted for 6 weeks during the summer. Paula's program consisted of 2 weeks of individual sessions (i.e., two, 1-hr sessions weekly) followed by 4 weeks of group sessions (i.e., three, 2-hr sessions weekly).

Intervention components. The intervention included role play of social scripts in which Paula and her peers assumed both adult and child roles, a checklist to guide the children through a routine for resolving social situations, and clinician modeling of socially appropriate responses.

Further description of these components follows.

Each of the social scripts consisted of a short paragraph that was read to the group; the script consisted of an introduction to a hypothetical situation. Three to five social scripts were role-played during each group intervention session. Examples of social scripts are available from the first author on request.

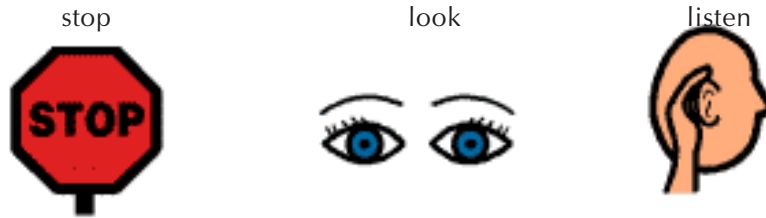
The checklist (see Figure 1) used a verbal script to guide the children's thinking and participation while taking turns during the role play. The checklist questions focused on the individual social cognitive skills in the Crick and Dodge (1994) model. The questions were designed to facilitate children's ability to identify what they and others knew about the situation. Further questions helped children identify a variety of response strategies to resolve a situation before selection and execution of one specific response. Specifically, the checklist addressed (a) describing the situation from one's own viewpoint and from another's perspective, (b) selecting an appropriate goal to resolve the situation, (c) stating and selecting several response strategies to reach the intended goal, and (d) evaluating the consequences of one's actions after executing the response.

During the initial sessions of both individual and group intervention sessions, the clinician modeled responses for each of the checklist questions. The clinician cued the children to read each question and expanded the children's answers if necessary.

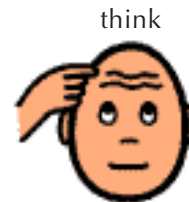
Intervention procedures. Paula's individual sessions consisted of construction and introduction to the checklist. With assistance, Paula created and decorated a booklet of four cards attached by a ring binder. During role play with

Figure 1 (page 1 of 2). Children's checklist consisting of four cards; Paula read and responded to the questions on the cards during role play of the social scripts.

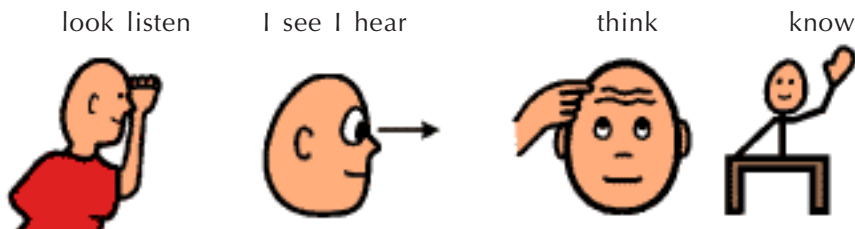
Card 1
STOP, LOOK, & LISTEN



1. Did I pay attention to the story?
 _____ YES! _____ NO, I need help!
2. What do I know?
3. How do I know this?



Card 2
**SEEING AND HEARING LEADS TO
THINKING AND KNOWING!**



1. Did I pay attention to what others saw
and heard?
 _____ YES! _____ NO, I need help!
2. What does everyone else think or know
about the story?
3. How do they know this?



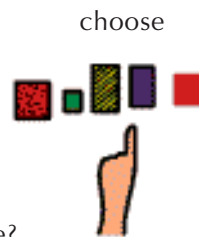
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Figure 1 (page 2 of 2). Children’s checklist consisting of four cards; Paula read and responded to the questions on the cards during role play of the social scripts.

**Card 3
PLAN AND TAKE ACTION!**

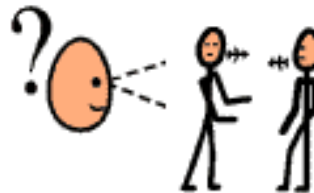


1. Do I know what I need to do?
 _____ YES! _____ NO, I need help!
2. What do you think I could do?
3. What do I think is the BEST choice?
4. Why do I believe this is the BEST choice?

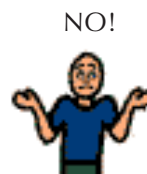


**Card 4
EVALUATE THE CONSEQUENCES!**

1. What do I think happened?
2. How do I know this?
3. What do others think happened?
4. Why do they think this?
5. Did it turn out the way I believed it would?



congratulations



Make
another
choice!

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the clinician, Paula read each of the checklist cards independently. This checklist was then used during role-play activities within the subsequent group sessions.

During the 2-hr group sessions, three to five social scripts were presented. In the early group sessions, the clinician read a social script, assigned roles for the script, and periodically “stopped the action” in the script to prompt the children to read and answer questions from one of the checklist cards. In later group sessions, Paula, along with the other children in the group, had opportunities to serve as the “clinician” and so assigned roles, “directed the action,” and decided when to “stop the action” to refer to the checklist. The children adapted the checklist questions as needed to complement the script (e.g., substituting a specific character’s name within the checklist question, “What does everyone else think or know about the story?”).

Generally, role play of an individual script continued until a resolution occurred and all of the questions on the checklist had been answered; however, sometimes several possible strategies (and thus resolutions) would be role-played. Role-play of less desirable strategies was completed to provide opportunities for the children to view the consequences of using these strategies.

Results: Intervention and Probe Sessions

Overview. To test the two clinical hypotheses (i.e., that the intervention would change Paula’s mental state verb production and social cognitive skills), intervention data and probe data were collected. The intervention data examined Paula’s responses to checklist questions that were likely to elicit the following: (a) mental state verbs (e.g., “What does he know?”), (b) strategies for obtaining a social goal (e.g., “What are all the things you could do?”), and (c) appropriate consequences for an action (e.g., “What is the best thing for you to do?”). In addition, probe sessions were conducted to examine changes in Paula’s mental state verb production during completion of theory of mind false belief tasks. See Table 2 for a schedule of the probe and intervention sessions. The probe sessions and tasks are described in the following section.

Mental state verb production. Probe sessions consisting of a set of false belief tasks were administered weekly for 3 weeks before the start of Paula’s intervention sessions (i.e., baseline), every other week during the intervention,

and for 2 consecutive weeks following the end of the intervention. During the probe sessions, the intervention checklist was available to Paula (i.e., placed on the table where the tasks were presented); however, Paula never elected to use the checklist as she responded to the questions described below.

Each probe session consisted of one original false belief task and five simplified false belief tasks whereby memory prompts, simple sentences, and a forced choice format were used to reduce the difficulty of the task. Examples of the false belief tasks are available from the third author on request. The final question for each false belief task was a “justification question,” that is, the child had to justify a character’s actions in the false belief story. For example, one false belief story involved two friends, “Joe” and “Susie.” They meet “Barney” (the children’s TV character) at school and Joe decides to have his picture taken with Barney but Joe’s camera is at home. Barney tells Joe and Susie that he will be at the children’s school all day and Joe leaves to get his camera. After Joe leaves, Barney tells Susie that he forgot about a birthday party in the park and he leaves for the park immediately. On the way to the park, Barney sees Joe and tells him that he is headed to the park. After hearing this story, children are asked a false belief question: “Where does Susie think Joe has gone to take his picture with Barney?” (correct answer is “at school”). Next, the justification question is asked: “Why does Susie think Joe has gone to *child’s answer to previous question* to take his picture with Barney?” Most children answer this question using zero to two mental state verbs (e.g., “Because that is what Barney said.” “Because Joe *thinks* Barney is at the school.” “Because Joe does not *know* that Barney is at the park and *thinks* he is at the school.”).

Paula’s mental state verb production in response to each justification question was tallied across the six false belief tasks presented within each probe session. The first author scored all of the data. A graduate student in the University of Washington’s Department of Speech and Hearing Sciences, who was not involved in the data collection, scored one randomly selected baseline, treatment, and withdrawal probe session. Scoring reliability was calculated by computing the number of agreements divided by the total number of disagreements and then multiplying by 100. Interjudge agreement was 100%.

Table 2. Schedule of Paula’s probe and intervention sessions.

<i>Weeks 1–3</i> <i>Baseline probes</i>	<i>Weeks 4–5</i> <i>Individual intervention</i>	<i>Weeks 6–10</i> <i>Group intervention & treatment probes</i>	<i>Weeks 11–12</i> <i>Withdrawal probes</i>
One probe session weekly	Two individual sessions weekly to construct the checklist and role-play social scripts with the clinician	Three group intervention sessions weekly to use the checklist during role-play of social scripts with peers & Probe sessions conducted every other week during the treatment phase (three sessions total)	One probe session weekly

Paula’s mental state production during the probe sessions is presented in Figure 2. During the baseline probes, Paula did not use any mental state verbs. She produced zero to two mental state verbs across the treatment probes, and one to four mental state verbs during the two withdrawal probes.

In addition to the probe sessions, Paula’s mental state verb production was observed within the intervention sessions whenever she responded to justification questions from the checklist (for example, “How do I know this?” or “Why do they think this?”). Paula began using mental state verbs during the first group session and continued to use these verbs throughout the sessions. Paula produced zero to one mental state verb per question. Although an increase in mental state verb production was not observed within each of her responses, changes in the length and complexity of Paula’s responses to checklist justification questions were observed. Examples of her responses to “how” and “why” questions across the initial and final weeks of group intervention include the following (mental state verbs are italicized in the following examples):

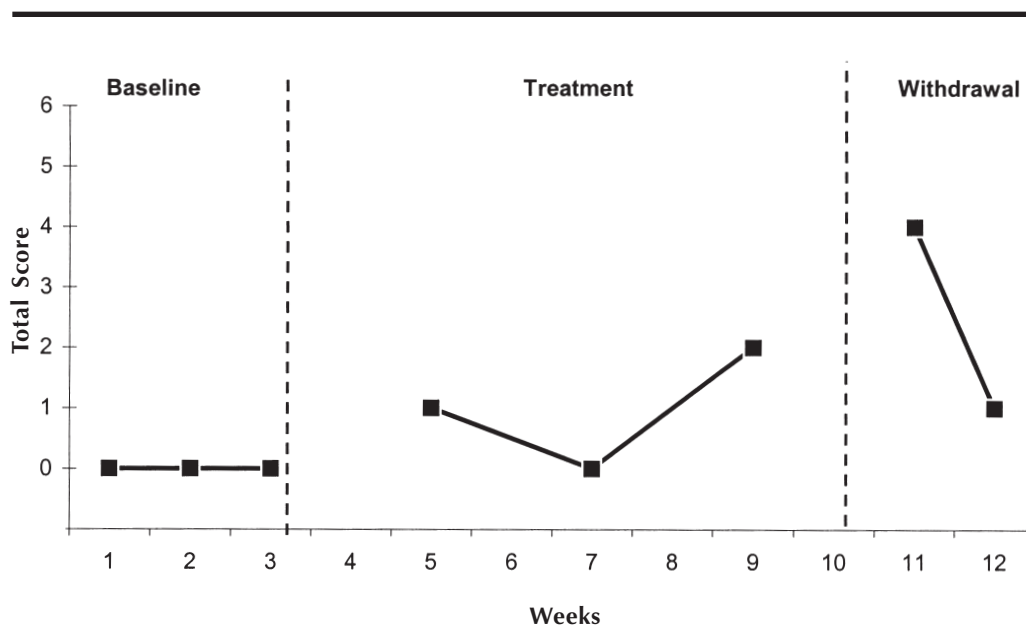
- Weeks 1–2: “Because I was in the story.”
 “Cause I told him I was going to the park to play.”
 “Because I gave him the park schedule.”
 “I *know* the message because I saw or heard about it.”
- Weeks 3–4: “I *know* Marco didn’t let me play soccer unless I gave him a one dollar bill.”
 “The teacher *thought* I was making this story up and I’m trying to get him in trouble because he told her a lie.”

“I *know* because I saw the toilet paper in the boy’s hand.”

“She *knows* that we got the wrong pizza because we were arguing about where we wanted to go and we went to Dominoes.”

Social cognitive skills. Changes in Paula’s social cognitive skills were measured from the intervention data. Paula’s responses to checklist questions were transcribed from the role play of two social scripts for each of three group intervention sessions. Because Paula was a participant in a group intervention session, she did not have an equal number of turns to respond to the checklist questions across the sessions because another child answered the checklist questions for a particular social script. Available intervention data for Paula revealed that the use of the checklist facilitated Paula’s ability to generate alternative strategies when approaching a social interaction. Between Week 1 and Week 4 of the group sessions, the average number of possible strategies Paula generated increased from two to four in response to the question, “What do I think I could do?” Although the number of her strategies increased, Paula’s first stated strategy continued to be less appropriate than the alternative strategies she generated because she would omit important information. Prompting was necessary to elicit alternative strategies that resulted in more socially appropriate solutions. Paula’s judgment of the consequences of her actions focused on “not getting into trouble” rather than on the other person’s beliefs, desires, or feelings. Her ability to state another person’s perspective when discussing the consequences of her actions did not change during the intervention.

Figure 2. Probe session data consisting of Paula’s mental state verb production in response to theory of mind false belief justification questions; six justification questions were presented during each probe session.



DISCUSSION

This case study was designed to explore the feasibility of teaching multiple interrelated skills to a school-age youngster with a complex cognitive and behavioral profile. The intervention emphasized facilitation and support of language, social cognitive, memory, and attention skills that impact a child's ability to be a competent social communicator and social problem solver. Although a single case study does not unequivocally demonstrate the effectiveness of an intervention, Paula's performance reveals several possible benefits and caveats of this intervention.

The feasibility of an intervention may be judged across multiple considerations, including the engagement of the consumers (in this case, Paula), the relevant contribution of the individual components embedded within the intervention, and the effectiveness of the measures used to document change as well as the effect of the intervention on selected behaviors of interest. Discussion of these topics follows.

Engagement

Paula's engagement in the intervention was demonstrated by her interest and enthusiasm during the role-play activities. Paula not only played different roles within one social script, but also adopted the role of the clinician to "stop the action" and read checklist questions. Paula's mother reported that her daughter enjoyed participating in the intervention and that Paula seemed to "ask more questions" when she did not understand what others were saying.

Intervention Components

Paula's participation in the intervention was enhanced by a combination of the intervention components. Because the components were introduced simultaneously, this case study did not systematically investigate the relative contribution of each component. Nevertheless, Paula's use of the intervention checklist does warrant a comment. Although Paula actively used the checklist during role-play activities, she did so only when prompted by the clinician. Anecdotal data suggest that children with FASD have difficulty generalizing new behaviors to a variety of contexts (Kleinfeld & Wescott, 1993). Paula's performance supports these observations and highlights the need to target generalization specifically in future interventions.

Measures

Mental state verb use appeared to be a viable measure of both linguistic and social cognitive change. The intervention facilitated Paula's production of mental state verbs during false belief tasks. Additionally, intervention data revealed that Paula consistently produced mental state verbs whenever she responded to relevant checklist questions (e.g., generally "why" questions). Interestingly, the linguistic complexity of Paula's responses to "why" questions increased over time through the addition of embedded

clauses. Although linguistic complexity was not targeted directly within this intervention, perhaps the changes in Paula's complex sentence production supported her improved false belief task performance. Indeed, intervention researchers have focused on syntactic training to change false belief performance (Guajardo & Watson, 2002; Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003). Further, recent work by de Villiers and de Villiers (2000) has demonstrated that deaf children who can process embedded clauses were more likely to understand and predict behaviors within false belief tasks.

Paula's growth in linguistic complexity extends previous research by providing support for targeting children's social cognitive skills to change mental state verb use. In addition to stating what another person was thinking or feeling, accurate answers to the checklist "why" questions required that Paula provide rationales for her statements. The checklist questions supplied embedded models of mental state verbs (e.g., "How do I know this?" "Why does she think that?"). Also, clinician modeling of appropriate responses to checklist questions provided ample examples of mental state verb use. Paula's mental state verb use within the intervention sessions and subsequent generalization of mental state verb use to the probe sessions was evident by the changes in her mental state verb use across baseline and intervention phases. She did not use any mental state verbs during the baseline probes but did produce several during the treatment and withdrawal probes. Although Paula's mental state verb production was variable throughout the treatment and withdrawal probes, it is noteworthy that she did not use any of these verbs until she began to produce them in response to checklist questions within the intervention sessions.

Intervention Effects

In addition to promoting mental state verb production, Paula's use of the intervention checklist increased her use of socially appropriate strategies generated to approach or resolve a social situation. Without use of the checklist, Paula generally accepted her first strategy to resolve a social situation. However, when Paula generated two or more socially appropriate strategies, she was more likely to select a "best choice," not simply a "first choice." For Paula, responding to checklist questions appeared to facilitate additional reflection and result in a more positive outcome for management of a specific situation. The ability to become more thoughtful and reflective in solving interpersonal situations is an important predictor of positive behavior change (Greenberg, Kusche, Cook, & Quamma, 1995). Paula's performance suggests such a change.

Although use of the checklist resulted in Paula stating and selecting more socially appropriate strategies, the checklist did not necessarily change Paula's predictions about the potential consequences of her actions. When reflecting about why one strategy would be a better choice than another, Paula's answers consistently focused on not getting into trouble rather than on the desires or feelings of another person. These results are not altogether surprising. Despite the fact that typically developing 8-year-old

children are able to take a second person's perspective about their own thoughts or actions (Selman, 1980), school-age children continue to point to "negative" consequences as the primary reason for obeying rules within both authority and peer groups (Shantz, 1982).

A FINAL THOUGHT

Paula's complex deficit profile clearly compromised her ability to manage everyday social situations effectively. Nevertheless, her participation in the social communication intervention increased her use of language, specifically mental state words, to manage social interactions more effectively within the context of the intervention paradigm. Further, the intervention checklist increased Paula's generation of and selection of socially appropriate strategies for managing social situations.

This feasibility study has provided important pieces of evidence that can strengthen the clinical viability of this social communication intervention. Paula made only modest changes following a short-term but relatively intensive group intervention (6 hr weekly across 4 weeks). Children with complex clinical profiles and long-term histories of social difficulties such as Paula's most likely need long-term and comprehensive interventions. The mere length of this intervention might have impacted the results. More importantly, the intervention probably needed to be more comprehensive, based on the pervasiveness of the problems. A critical component missing from this preliminary investigation is a plan to target generalization of intervention components at the onset. For example, Paula may have initiated use of the checklist within the probe sessions if she had been prompted to do so within the early sessions. In addition, future investigations of this intervention should focus on increasing children's use of the checklist across role-play activities with relevant peers (i.e., members from the child's classroom). Further, classroom teachers could be enlisted to prompt use of the checklist during ongoing or "on-the-spot" social difficulties in the classroom setting. This would likely be an important intervention component for children with FASD, who often demonstrate different performances in the classroom than they do at home (Timler & Olswang, 2001). Finally, although mental state verb use provided an effective measure of linguistic change during this intervention, the "clinical/functional significance" (Bain & Dollaghan, 1991) of this change was not evaluated. Measures of social communication skills within everyday social interactions are needed to provide a functional measure of change. Ideally, such measures would be of specific skills tied to social communication performance, such as choosing a socially appropriate strategy to resolve a peer conflict occurring within a group activity in the child's classroom. Such choices would demonstrate that the child is beginning to consider another person's perspective during these social interactions. Subsequent investigations of the efficacy of this intervention should employ such measures collected within probe settings that sample functional communication opportunities in the child's

classroom. These measures would document the practical and relative significance of linguistic changes observed within the intervention setting.

For children with complex clinical profiles involving language, social cognitive, and attention or memory difficulties, execution of effective social communication presents a tremendous challenge. The intervention presented here addressed multiple deficits while facilitating a child's ability to reflect, plan, and evaluate her responses. Clearly, further study is needed to determine the relative contribution of individual intervention components and the optimal length of time to administer this intervention. Nevertheless, the feasibility of the intervention and measures explored in this study hold promise for professionals who must treat social communication difficulties in school-age children with diverse etiologies and clinical profiles.

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REFERENCES

- American Speech-Language-Hearing Association.** (2000). *Guidelines for the roles and responsibilities of school-based speech-language pathologists*. Rockville, MD: Author.
- Appleton, M., & Reddy, V.** (1996). Teaching three year-olds to pass false belief tests: A conversational approach. *Social Development, 5*(3), 275–291.
- Astington, J., Harris, P., & Olson, D.** (Eds.). (1988). *Developing theories of mind*. New York: Cambridge University Press.
- Astley, S., & Clarren, S.** (2000). Diagnosing fetal alcohol syndrome: Introducing the 4-digit diagnostic code. *Alcohol and Alcoholism, 35*, 400–410.
- Bain, B., & Dollaghan, C.** (1991). The notion of clinically significant change. *Language, Speech, and Hearing Services in Schools, 22*, 264–270.
- Baron-Cohen, S.** (1989). The autistic child's theory of mind: A case of specific developmental delay. *Journal of Child Psychology and Psychiatry, 30*, 285–297.
- Baron-Cohen, S., & Howlin, P.** (1993). The theory of mind deficit in autism: Some questions for teaching and diagnosis. In S. Baron-Cohen, H. Tager-Flusberg, & S. Cohen (Eds.), *Understanding other minds: Perspectives from autism* (pp. 466–480). New York: Oxford University Press.
- Bell, K., & Kirby, J.** (2002). Teaching emotion and belief as mindreading instruction for children with autism. *Developmental Disabilities Bulletin, 30*(1), 16–58.
- Bliss, L. S.** (1992). A comparison of tactful messages by children with and without language impairment. *Language, Speech, and Hearing Services in Schools, 23*, 343–347.
- Charman, T., & Shmueli-Goetz, Y.** (1998). The relationship between theory of mind, language, and narrative discourse: An experimental study. *Current Psychology of Cognition, 17*, 245–271.

- Coggins, T.** (1997, July). *Assessment of language and social communication in FAS*. Invited paper presented at the Prevention and Management–Fetal Alcohol Syndrome and Prenatal Substance Abuse Conference, Breckenridge, CO.
- Coggins, T., Friet, T., & Morgan, T.** (1998). Analyzing narrative productions in older school-age children and adolescents with fetal alcohol syndrome: An experimental tool for clinical applications. *Clinical Linguistics & Phonetics, 12*, 221–236.
- Coggins, T., Olswang, L., Olson, H. C., & Timler, G.** (2003). On becoming socially competent communicators: The challenge for children with fetal alcohol exposure. In L. Abbeduto (Ed.), *International review of research in mental retardation: Vol. 27. Language and communication in mental retardation* (pp. 121–150). San Diego, CA: Academic Press.
- Crick, N. R., & Dodge, K. A.** (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74–104.
- de Villiers, J., & de Villiers, P.** (2000). Linguistic determinism and the understanding of false belief. In P. Mitchell & K. Riggs (Eds.), *Children's reasoning and the mind* (pp. 189–226). Hove, UK: Psychology Press.
- Frith, U., Happe, F., & Siddons, F.** (1994). Autism and theory of mind in everyday life. *Social Development, 3*, 109–124.
- Gillam, R.** (2003, June). *Measuring language development and language disorders: Documenting treatment outcomes*. Symposium conducted at the meeting of the 24th Annual Symposium of Research in Child Language Disorders, Madison, WI.
- Greenberg, M., Kusche, C., Cook, E., & Quamma, J.** (1995). Promoting emotional competence in school-aged children: The effects of the PATHS curriculum. *Development and Psychopathology, 7*, 117–136.
- Gresham, F., & Elliott, S.** (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service.
- Gresham, F., Sugai, G., & Horner, R.** (2001). Interpreting outcomes of social skills training for students with high-incidence disabilities. *Exceptional Children, 67*, 331–344.
- Guajardo, N., & Watson, A.** (2002). Narrative discourse and theory of mind development. *The Journal of Genetic Psychology, 163*(3), 305–325.
- Hadwin, J., Baron-Cohen, S., Howlin, P., & Hill, K.** (1996). Can we teach children with autism to understand emotions, beliefs, or pretence? *Development and Psychopathology, 8*, 345–365.
- Hadwin, J., Baron-Cohen, S., Howlin, P., & Hill, K.** (1997). Does teaching theory of mind have an effect on the ability to develop conversation in children with autism? *Journal of Autism and Developmental Disorders, 27*(5), 519–537.
- Hale, C., & Tager-Flusberg, H.** (2003). The influence of language on theory of mind: A training study. *Developmental Science, 6*(3), 346–359.
- Hamilton, M.** (1981). *Linguistic abilities of children with fetal alcohol syndrome*. Unpublished doctoral dissertation. University of Washington, Seattle.
- Happe, F.** (1995). The role of age and verbal ability in the theory of mind task performance of subjects with autism. *Child Development, 66*, 843–855.
- Kamps, D., Kravits, T., & Ross, M.** (2002). Social–communicative strategies for school-age children. In H. Goldstein, L. Kaczmarek, & K. English (Eds.), *Promoting social communication: Children with developmental disabilities from birth to adolescence* (pp. 239–278). Baltimore: Paul H. Brookes.
- Kazdin, A., & Weisz, J.** (1998). Identifying and developing empirically supported child and adolescent treatments. *Journal of Consulting and Clinical Psychology, 66*(1), 19–36.
- Kleinfeld, J., & Wescott, S.** (1993). *Fantastic Antone succeeds! Experiences in educating children with fetal alcohol syndrome*. Fairbanks, Alaska: University of Alaska Press.
- Knoll, M., & Charman, T.** (2000). Teaching false belief and visual perspective taking skills in young children: Can a theory of mind be trained? *Child Study Journal, 30*(4), 273–304.
- Kodituwakku, P., May, P., Ballinger, L., Harris, M., Aase, J., & Aragon, A.** (1997, July). *Executive control functioning and theory of mind in children prenatally exposed to alcohol*. Poster session presented at the Prevention and Management–Fetal Alcohol Syndrome and Prenatal Substance Abuse Conference, Breckenridge, CO.
- Koegel, L., Koegel, R., Hurley, C., & Frea, W.** (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis, 25*, 341–353.
- Korkman, M., Kirk, U., & Kemp, S.** (1997). *Comprehensive Assessment of Neuropsychological Development in Children*. San Antonio, TX: The Psychological Corporation.
- LeBlanc, L., Coates, A., Daneshvar, S., Charlop-Christy, M., Morris, C., & Lancaster, B.** (2003). Using video modeling and reinforcement to teach perspective-taking skills to children with autism. *Journal of Applied Behavior Analysis, 36*, 253–257.
- Leslie, A. M.** (1992). Pretense, autism, and the theory of mind module. *Current Directions in Psychological Science, 1*, 18–21.
- Lohmann, H., & Tomasello, M.** (2003). The role of language in the development of false belief understanding: A training study. *Child Development, 74*(4), 1130–1144.
- McFadyen-Ketchum, S., & Dodge, K.** (1998). Problems in social relationships. In E. J. Mash & R. A. Barkley (Eds.), *Treatment of childhood disorders* (2nd ed., pp. 338–365). New York: Guilford Press.
- Melot, A., & Angeard, N.** (2003). Theory of mind: Is training contagious? *Developmental Science, 6*(2), 178–184.
- Miller, C. A.** (2004). False belief and sentence complement performance in children with specific language impairment. *International Journal of Language & Communication Disorders, 39*(2), 191–213.
- National Organization on Fetal Alcohol Syndrome.** (2004, April). *Historic agreement heralds new era for prevention and treatment of fetal alcohol spectrum disorders*. Washington, DC: Author.
- Olson, H. C., Morse, B., & Huffine, C.** (1998). Development and psychopathology: Fetal alcohol syndrome and related conditions. *Seminars in Clinical Neuropsychiatry, 3*, 262–284.
- Olswang, L., Coggins, T., & Timler, G.** (2001). Outcome measures for school-age children with social communication problems. *Topics in Language Disorders: Alternative Measures for Evaluating Treatment Outcomes, 22*(1), 50–73.
- Ozonoff, S., & Miller, J.** (1995). Teaching theory of mind: A new approach to social skills training for individuals with autism. *Journal of Autism and Developmental Disorders, 25*(4), 415–433.
- Prelock, P.** (2002). Communicating with peers in the classroom context: The next steps. In K. Butler & E. Silliman (Eds.), *Speaking, reading, and writing in children with language learning disabilities* (pp. 259–273). Mahwah, NJ: Erlbaum.
- Selman, R. L.** (1980). *The growth of interpersonal understanding: Developmental and clinical analyses*. New York: Academic Press.

- Semel, E., Wiig, E., & Secord, W.** (1995). *Clinical Evaluation of Language Fundamentals—Third Edition*. San Antonio, TX: The Psychological Corporation.
- Shantz, C. U.** (1982). Children's understanding of social rules and the social context. In F. C. Serafica (Ed.), *Social-cognitive development in context* (pp. 167–198). New York: Guilford Press.
- Silliman, E., Diehl, S., Bahr, R. H., Hnath-Chisolm, T., Zenko, C. B., & Friedman, S.** (2003). A new look at performance on theory-of-mind tasks by adolescents with autism spectrum disorder. *Language, Speech, and Hearing Services in Schools, 34*, 236–252.
- Streissguth, A., Barr, H., Kogan, J., & Bookstein, F.** (1996). *Understanding the occurrence of secondary disabilities in clients with fetal alcohol syndrome and fetal alcohol effects. Final report to the Centers for Disease Control and Prevention, August 1996* (Tech. Rep. No. 96-06). Seattle, WA: University of Washington Press.
- Thomas, S., Kelly, S., Mattson, S., & Riley, E.** (1998). Comparison of social abilities of children with fetal alcohol syndrome to those of children with similar IQ scores and normal controls. *Alcoholism: Clinical and Experimental Research, 22*, 528–533.
- Timler, G.** (2000). *Investigation of social communication skills during peer conflict tasks in school-age children with alcohol related disabilities*. Unpublished doctoral dissertation, University of Washington, Seattle, WA.
- Timler, G., & Olswang, L. B.** (2001). Variable structure/variable performance: Caregiver and teacher perspectives of a school-age child with fetal alcohol syndrome. *Journal of Positive Behavior Interventions, 3*(1), 48–56.
- Wechsler, D.** (1991). *Wechsler Intelligence Scale for Children—III*. San Antonio, TX: The Psychological Corporation/Harcourt Brace Jovanovich.

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