Expansion Activities

The Main Event

The topic for Volume 4, Issue 5, is Tattling vs. Telling. Our guest editor is Aileen Collucci. She has written The Main Event and has provided some terrific tips for teaching the topic.

Good ideas for teaching learners to understand the difference between tattling and telling better include:

• Ask students to brainstorm scenarios that would fall into the tattling category and the telling category. Have students tell you why they put a specific item into a given category. If students need prompts, try some of the following scenarios (a) a student announces to another student that she is going to skip class, (b) a student cheats on a test, (c) a student bullies another student, (d) a student comes to class late and the teacher doesn’t notice.

• Discuss the term “tattletale.” Ask students to research the origin of the term.

• Ask students to make a video about a new product that will detect tattling or differentiate tattling from telling.
Departments

I Second That Emotion!
This can be a fun activity for you and your students. Start with a list of common school behaviors (both good and not-so-good). First, have students guess how you would rate the behaviors and then tell them your actual rating. This activity can spark an interest in how other people feel about everyday situations.

Coming to Our Senses:
The topic in this issue is taste. It was submitted by Heather Pugh. Some ideas to discuss are:
1. Place students in small groups and ask them to “refresh themselves” on the previous Coming to Our Senses column (Volume 4, 4) on smells.
2. Ask students to identify their level of hypersensitivity or hyposensitivity related to taste by indicating whether they have any of the characteristics listed in the article (see worksheet below).
3. Brainstorm with students how they can address their hyper- and hyposensitivity.
4. Invite an occupational therapist in to talk about hypersensitivity and hyposensitivity related to taste.

Gets-It Knows!
This is a good letter to read aloud followed by Roger's answer. Ask your students what they think about what Roger says. Would it be hard for the students to ask their teacher about something like this? If they don't think Roger's answer is correct, why do they think the teacher is not calling on Smart?

Puzzle Time:
Use the puzzles as a supplemental activity to reinforce the topic lesson. The answers are posted on this website. You can expand on the use of the puzzles by listing the key words on the board and asking your group what they learned about the words.

Tip to Combat Bullying:
1. Brainstorm with students what you can do if you see a person being bullied.
2. Role play how to support a person who has been or is being bullied.

Animal Facts:
Throughout the magazine, fun facts involving animal behavior are interspersed. We hope this will increase the entertainment quotient of the overall magazine experience.
Something to Talk About:

This is a true story. Research indicates that sharing true stories about social dilemmas can help a person to understand such situations better. When reviewing this article with your students, try to think of a similar story that you can recall from your own childhood or a friend’s life. This story is about having a friend who swore a lot. First the friend just swore to make other people laugh, but then he swore because it became a habit. Ask your students why they think some people swear and never get into trouble. What are they doing differently from the kids who get into trouble?

The Cartoon: Note: The abstract nature of the cartoon is purposeful. Social rules and social faux pas are subtle and this activity gives students an opportunity to analyze the social information, point by point.

It is expected that the teacher or group leader will support this using the following prompt questions:

- What is funny or interesting about this cartoon?
- What is the texting girl doing?
- Do you think this is rude?
- How do you think the other girl is going to feel?
- What is a good texting manners rule for this?
# A Worksheet on the Gustatory System: Hypersensitivity and Hyposensitivity

Check the things that are like you and brainstorm what to do.

<table>
<thead>
<tr>
<th>Y/N</th>
<th>HOW YOU FEEL</th>
<th>WHAT YOU CAN DO ABOUT IT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Like to drink only one or two things</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easily gag when you see something bad or when someone talks about something gross</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not like to eat certain foods because they taste funny</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eat really fast and chew really loudly – a messy eater</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do not like your food to touch each other on the plate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not like spicy or hot foods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Like really spicy or really hot foods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eat things that are not food</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not noticing when food is on your face</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drooling</td>
<td></td>
</tr>
</tbody>
</table>
Aileen Collucci is a licensed speech-language pathologist with a private practice in Little Falls, New Jersey. She specializes in the diagnosis and treatment of persons with social-communication deficits. Aileen has over 18 years of experience in the field, which includes developing and leading a successful social-communication skills group intervention program in Fairfield, New Jersey. She has conducted training workshops for parents of children with special needs and educational professionals in many areas, including social skills intervention planning, autism, and pragmatic language development and disorders. She holds a master’s degree in speech-language pathology and audiology from New York University and state licenses in speech and language pathology in both New Jersey and New York. She also maintains a Certificate of Clinical Competence from the American Speech-Language and Hearing Association.

Heather Pugh is an editorial associate for AAPC and marketing consultant.

Resources for the Main Event Are:
To order the following resources, go to www.aapcpublishing.net or call us toll free, 1.877.277.8254.


Resources Used in This Issue to Address Sensory Issues Include:
To order, go to www.aapcpublishing.net or call us toll free, 1.877.277.8254.


Supplemental Research Article
General Information for All Personnel

As discussed in the previous issues, learners with ASD have myriad communication problems. These challenges include knowing what information should or should not be shared. This is particularly important in the area of “tattling.”

Students with ASD are very concrete – they believe that all rules should be followed by everyone always. Many also think that they are not a part of everyone. In addition, many cannot tell the difference between information that is helpful, kind, and necessary and information that is not.

A visual support may help learners understand the difference between tattling and telling. In situations in which a student with ASD is experiencing difficulty knowing what to relate, this visual could serve as a starting point for a discussion:

<table>
<thead>
<tr>
<th>What happened?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the person hurting himself, someone else, or you?</td>
</tr>
<tr>
<td>If you told an adult, such as a teacher or your parent, would it help someone?</td>
</tr>
<tr>
<td>What should you do?</td>
</tr>
</tbody>
</table>

When a rule is broken, many learners on the spectrum view this as the first step toward impending chaos. That is, to them, one broken rule leads to potentially all rules being broken. In such cases, we see the phenomenon called the “rules police” where the student with ASD moves into action to “preserve the environment.”

An intervention for the “rules police” is to place a “Rules Infraction Handbook” at the back of the classroom. The teacher informs the entire class that if a rule is broken, the student who is concerned about the infraction can write the incident in the handbook. The teacher also tells the students that he, the teacher, will read the handbook and talk privately with the student who broke the rule.
Tattling vs. Telling – Word Search Answers

Word Bank:
- COMIC
- IMMEDIATE
- RESPONSIBILITY
- RULES
- SERIOUS
- SIBLINGS
- SITUATION
- TATTLETALE
- TEXTBOOK
- TROUBLE

[Word Search Puzzle with highlighted words]
Tattling vs. Telling – Crossword Answers

ACROSS
1) to agitate or upset
2) a personal burden or obligation
3) something that wasn't what you were expecting
4) when you give a little and the other person gives a little
5) instructions for doing something
6) an action that is generally OK with other people
7) being well liked by many
8) idle talk; telling secrets or gossiping
9) brother or sister
10) an action that is generally OK with other people

DOWN
1) to agitate or upset
2) a personal burden or obligation
3) something that wasn't what you were expecting
4) when you give a little and the other person gives a little
5) instructions for doing something
6) an action that is generally OK with other people
7) being well liked by many
8) idle talk; telling secrets or gossiping
9) brother or sister
Tattling vs. Telling – Quiz

Name: ____________________________________

1. If you saw someone being bullied and told the teacher, would that be considered tattling?
   Yes  No

2. A “tattletale” is a story that is not true.
   Yes  No

3. Tattling will make you more popular with other students.
   Yes  No

4. If someone talks to you about doing drugs, should you tell an adult?
   Yes  No

5. Bullying can be words, actions, or looks.
   Yes  No
Tattling vs. Telling – Quiz Answers

1. If you saw someone being bullied and told the teacher, would that be considered tattling.
   Yes
   No

2. A “tattletale” is a story that is not true.
   Yes
   No

3. Tattling will make you more popular with other students.
   Yes
   No

4. If someone talks to you about doing drugs, should you tell an adult?
   Yes
   No

5. Bullying can be words, actions, or looks.
   Yes
   No
Judgments of Cause and Blame: Sensitivity to Intentionality in Asperger’s Syndrome

Shelley Channon · David Lagnado · Sian Fitzpatrick · Helena Drury · Isabelle Taylor

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Abstract Sensitivity to intentionality in people with Asperger’s syndrome (AS) and matched controls was investigated using two scenario-based tasks. The first compared intentional and unintentional human actions and physical events leading to the same negative outcomes. The second compared intentional actions that varied in their subjective and objective likelihood of bringing about a negative outcome. Whilst adults with AS did not differ from controls in their judgments of causality, or in their blame judgments in relation to non-mentalistic factors, they showed heightened sensitivity to mentalistic considerations in their attributions of blame. They made greater differentiation than controls between intentional and unintentional actions, and also between actions that the protagonists believed to be likely versus unlikely to lead to negative consequences.

Keywords Moral judgment · Mentalising · Theory of mind · Causal inference · Asperger’s syndrome

Introduction

Impairment in reasoning about mental states is well documented in Asperger’s syndrome (AS), but the extent to which this has an influence on wider issues relating to social judgment remains to be determined. Making causal attributions about human actions is a fundamental aspect of everyday life, forming part of our efforts to comprehend and regulate our society. After major events, particularly negative ones, there is a desire to understand how they happened and who was responsible (Alicke 2000; Heider 1958; Hilton et al. 2005; Kelley 1967; McClure et al. 2007; Shaver 1985). Once this is established, it can then be determined whether an individual can be held accountable. However, making judgments about human actions may be particularly complex, since this requires consideration of multiple mentalistic factors such as the intentions and motives behind actions and beliefs about their consequences.

Folk-conceptual models propose that people have an intuitive understanding of human behaviour, interpreting human actions with reference to mentalistic processes such as intentions and beliefs (see e.g. Malle 2004). Both intentionality and subjective foreseeability can be thought of as mentalistic processes describing the internal state of an individual at a given time. Both these processes might therefore be expected to influence blame, since one might easily blame an individual more for pursuing a course of action if they decide to carry it out on purpose rather than by accident, or if they know in advance that it is likely to lead to a potentially bad outcome. A recent study by Lagnado and Channon (2008) manipulated the mental states (the intentions) of protagonists in a series of everyday scenarios, and demonstrated an influence of mentalistic states on both cause and blame judgments, with intentional actions rated as more causal and more blameworthy than unintentional actions. In a second experiment, they examined the distinction between objective and subjective foresight in relation to cause and blame. Actions that were highly foreseeable were rated as more causal and more blameworthy.

This bias towards attributing greater responsibility to intentional than to unintentional actions is consistent with
other recent work that indicates a bias towards perceiving human actions as intentional rather than unintentional (e.g. Baron-Cohen 1995; Premack 1990). This has been found to be especially true if the actions are perceived to be bad rather than good from a moral standpoint (Knobe 2004). Such findings potentially reflect an automatically processed belief in the intentional nature of human actions (Rosset 2008). A bias in neurotypical participants towards assigning responsibility to human actions versus physical events has also been repeatedly documented (see e.g. Försterling 2001).

Channon et al. (2010b) compared participants with frontal lesions, posterior lesions and matched controls in making causal attributions about intentional human actions, accidental human actions and physical events. No group differences were detected in the tendency to favour human actions over physical events. However, the tendency to prioritise intentional over unintentional human actions was found to be attenuated in those with frontal lesions, who may be impaired in their capacity to construe mentalistic processes in causal attributions. Blunted sensitivity to intentionality in the frontal group was linked to impairment in working memory and control of interference, suggesting that these executive skills play a role in performance.

Should people with AS be expected to show similar insensitivity to intentionality in human actions, and does this extend to foreseeability? The limited evidence available to date is mixed. On the one hand, autistic children are able to separate good and bad actions deserving reward or punishment (Leslie et al. 2006). Moreover, children with AS have demonstrated intact ability to distinguish between good and bad motives, although the reasoning behind this may be weaker than that shown by control children (Grant et al. 2005). On the other hand, AS has repeatedly been linked to impaired social judgment in relation to empathising with others (e.g. Lombardo et al. 2007; Minio-Paluello et al. 2009) and comprehending their mental states (e.g. Castelli et al. 2002; Happé 1994; Joliffe and Baron-Cohen 1999). One relevant study by Channon et al. (2010a) compared AS participants and controls in punishment judgments using car accident scenarios all leading to similar negative outcomes. They manipulated the degree of driver negligence and the justifications given by drivers for their actions, and found that AS participants were similar to controls in their judgments with respect to compensation and sympathy for the victim and the fines they imposed on the driver. However, the AS group made greater differentiations in their sympathy judgments with respect to driver justifications, showing lower sympathy towards drivers with poor justifications for their actions. Hence, they appeared to take more of a black-and-white approach than the control group, perhaps reflecting reduced tolerance for human weakness. It was observed that these scenarios did not require participants to infer the mental states of the characters involved, and hence may not have made heavy demands upon social/emotional processes underpinning mentalising.

The present study was designed to examine the extent to which participants with AS differed from controls with respect to their judgments. Two scenario-based tasks derived from those developed by Lagnado and Channon (2008) were used. The first compared intentional actions, unintentional actions and physical events, all of which resulted in the same ultimate negative outcomes. The central question was whether those with AS assigned higher responsibility ratings to intentional than to unintentional acts. In view of the evidence of impaired mentalising and social judgment in AS (see above), it was predicted that sensitivity to the distinction between intentional and unintentional actions would be reduced in those with AS relative to control participants, but that they should show a preserved bias in attributing greater responsibility to human actions than to physical events, since this is a much broader distinction than that between different types of human action.

The second task examined the effects of subjective and objective foreseeability on the judgment of intentional human actions leading to negative outcomes. In this task, participants were presented with everyday scenarios that depicted a protagonist committing a negative act towards someone else. The foreseeability (high/low) of this action being successful in reality (objective foreseeability) and the protagonist’s view about whether the action would be successful (subjective foreseeability) were manipulated. In addition, people’s judgments of moral wrongdoing are influenced by circumstances such as mitigating factors justifying the protagonists’ actions (e.g. Carlsmith et al. 2002; Cushman 2008). In the present study, two different justifications for the negative actions were provided, to see whether these influenced judgments. Motives based on the protagonist’s envy of their victim’s situation were expected to elicit higher responsibility ratings than those justified by the protagonist’s revenge on their victim for a previous negative action directed towards them. The main question of interest with this task was therefore whether the AS and control groups would be equally sensitive to mentalistic considerations in their attribution ratings. It was predicted that relative to the control group, those with AS would show reduced sensitivity to high/low subjective foreseeability and to type of motive, but that their sensitivity to high/low objective foreseeability would not be affected. The role of executive contributions to performance was also examined in the present study, since both interference control and working memory may play a role in focusing on and evaluating the relevant sources of information to make social judgments. Any mentalising difficulties in
those with AS may be linked to greater dependence on executive rather than social/emotional processes to make social judgments, relative to control participants. The AS group might therefore be expected to show higher correlations than the control group between executive skills and social judgment.

**Methods**

**Participants**

Twenty participants (15m, 5f) who had previously undergone a clinician-administered interview and met diagnostic criteria for AS according to DSM-IVTR criteria (American Psychiatric Association 2000) took part in the study. Exclusion criteria were comorbid major psychiatric disorder according to DSM-IVTR, including ADHD, OCD or any other disorder; a history of learning disability, physical illness or injury that might have affected brain function. Inclusion criteria were fluency in English, age between 18 and 65, and a Full Scale IQ score of 85 or above on the Wechsler Test of Adult Reading (WTAR; Wechsler 2001).

Eighteen control participants (13m, 5f) who met the inclusion criteria and who matched the AS group on age, years of education and WTAR IQ also took part in the study. The two groups did not differ significantly in age, years of education or WTAR Full Scale IQ (all \( p > .1 \)). Mean scores and standard deviations are shown in Table 1.

**Materials**

**Causal Intentionality Task**

This task was adapted from Lagnado and Channon (2008). It consisted of different scenarios, each with a chain of events leading to an unpleasant outcome. All scenarios contained an initial background description (A) that set the scene, an intermediate event (B) and a final outcome (C). There were two critical events in each chain (1) and (2), which were intentional human actions, unintentional actions or physical events. There were twelve scenarios in all. Four scenarios contained intentional and unintentional human actions, four contained intentional actions and physical events, and four contained unintentional actions and physical events (see Fig. 1). The order of the critical events was counterbalanced within each set of four.

Participants were instructed that they would read a series of short stories that would appear one at a time on the computer screen. They were informed that there was no need to remember the story, since it would stay on the screen. To ensure that participants understood the instructions, any questions were addressed and they did a practice example before starting the task proper. For each problem participants were first presented with a causal scenario. Once they had read this they made causal ratings for both events in the chain (to what extent was each event the cause of the outcome, on a 4-point scale), and then made blame ratings for both events in the chain (to what extent was each event to blame for the outcome, using the same 4-point scale). Ratings of cause and blame were as follows: 1 (very weakly), 2 (weakly), 3 (strongly) and 4 (very strongly). The resulting values were initially averaged for each intentional judgment, for each unintentional judgment, and for each physical judgment, for both cause and blame. There were 8 judgments involving intentional actions (4 intentional-unintentional and 4 intentional-physical), 8 judgments involving unintentional actions (4 intentional-unintentional and 4 unintentional-physical), and 8 judgments involving physical events (4 intentional-physical and 4 unintentional-physical).

**Causal Foreseeability Task**

This task also consisted of brief scenarios, each stating that the protagonist disliked the other character, and a reason relating to either envy or revenge (2 levels of motive) was included to explain why the protagonist felt this way. The protagonist always intended to do something unpleasant but then either believed that their action would be successful or unsuccessful in achieving this outcome (2 levels of subjective foreseeability). The actual likelihood of the event was also manipulated to be either likely or unlikely to occur (2 levels of objective probability). These levels were organised to provide 4 versions of each type of foreseeability:

- High subjective foreseeability, High objective foreseeability (HSHO)
- High subjective foreseeability, Low objective foreseeability (HSLO)
- Low subjective foreseeability, High objective foreseeability (LSHO)
- Low subjective foreseeability, Low objective foreseeability (LSLO)

1 NB A 4-point scale was used for the causal intentionality task (but not for the causal foreseeability task) for comparability with the lesion study of Channon et al. (2010a, b), which used this simpler scale to study causal intentionality.

### Table 1 Mean scores and standard deviations for demographic data

<table>
<thead>
<tr>
<th></th>
<th>Asperger group Mean (SD)</th>
<th>Control group Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.50 (14.25)</td>
<td>43.83 (13.74)</td>
</tr>
<tr>
<td>Years of education</td>
<td>15.05 (1.43)</td>
<td>15.17 (1.42)</td>
</tr>
<tr>
<td>WTAR Full Scale IQ</td>
<td>108.68 (6.74)</td>
<td>110.89 (3.95)</td>
</tr>
</tbody>
</table>
Low subjective foreseeability, High objective foreseeability (LSHO)
Low subjective foreseeability, Low objective foreseeability (LSLO)

In all cases the actions led to a negative outcome. Two examples of scenario were used, thus generating 16 scenarios in total (2 levels of motive, 4 types of foresight and 2 scenarios. Examples are shown in Fig. 2. The procedure was similar to that of the causal intentionality task. The scenarios remained on the screen throughout. After reading each scenario they were asked to judge to what extent the protagonist was the cause of the outcome (0–100 scale), and to blame for the outcome (0–100 scale). The resulting values were initially averaged across the two examples of each scenario type, to give 8 ratings (high/low objective foreseeability by high/low subjective foreseeability by envy/revenge motive), for both cause and blame.

Clinical Executive Tests

Participants also completed two clinical executive tests. Working memory was assessed using the Letter-Number Sequencing subtest of the Wechsler Memory Scale—Third Edition (WMS-III; Wechsler 1997). This task presents strings of alternating letters and numbers of increasing length, and participants are required to report the strings in
alphabetical and numerical order; the number of correct strings was scored. Control of interference was measured using the Colour-Word Interference Test (from DKEFS battery; Delis et al. 2001). This version of the Stroop task consists of two control conditions, Colour Naming and Word Reading, and two interference control conditions, naming colour words written in conflicting-colour inks (e.g. red in green ink) and alternating between naming the colour word or the ink colour. An overall interference control error score was calculated by adding together the number of errors on the two interference control components and subtracting from this the number of errors on the two control components.

Procedure

Ethical approval for the study was granted by the Joint UCL/UCLH Committee on the Ethics of Human Research, and all participants gave written informed consent in accordance with this.

Results

Mean scores and standard deviations for the AS and control groups are shown in Table 2.

Causal Intentionality Task

The central question was whether the groups differentiated in their cause and blame ratings between intentional and unintentional human acts, and also whether they differentiated between intentional acts and physical judgments. In order to address this, ANOVA for type of judgment (intentional, unintentional, physical) by group (AS vs. control) was carried out. Since cause and blame judgments were examined separately, an adjusted significance level of .05/2 was adopted.

For cause ratings there was no significant main effect of group, $F(1,36) = 0.00, p = .991$, and the group by intentionality interaction was also not significant, $F(2,35) = 1.61, p = .214$. There was a significant main effect of intentionality, $F(2,35) = 7.31, p = .002$; post-hoc comparisons showed that participants gave significantly higher cause ratings to intentional versus unintentional acts ($p = .002$), but did not differentiate significantly between intentional and physical ratings ($p > .025$) (see Table 2).

When blame ratings were examined, there was again a significant main effect of intentionality, $F(1,36) = 60.69, p = .0001$; post-hoc comparisons showed that participants gave significantly higher blame ratings to intentional versus unintentional acts ($p = .0001$), and also to intentional acts versus physical events ($p = .0001$). The main effect of group was not significant ($p > .025$), but there was a significant group by intentionality interaction, $F(2,35) = 4.18, p = .024$. Post-hoc t-tests comparing mean difference scores for intentional and unintentional acts showed that contrary to our prediction, the AS group differentiated more rather than less than the control group between intentional and unintentional acts, $t(36) = 2.48, p = .018$; as expected, the AS group did not differ significantly from the control group when ratings for human (intentional and unintentional) versus physical events were compared, $t(36) = 2.70, p = .011$ (see Table 2).

Causal Foreseeability Task

The central question for this task was whether the AS and control groups differed in their sensitivity to mentalistic considerations; it was expected that the AS group would show reduced sensitivity to high/low subjective foreseeability and to type of motive, but would not differ from the control group in sensitivity to high/low objective foreseeability. A significance level of .05/2 was again used to examine cause and blame judgments separately. ANOVA was conducted with one between-groups factor (AS vs. control) and three within-groups factors, objective foreseeability (high, low), subjective foreseeability (high, low) and motive (envy vs. revenge). For causal ratings, there was no evidence of any differences between the two groups (see Table 2). The main effect of group was not significant, and there were no significant interactions involving group ($p > .025$). There was a significant main effect of motive, $F(1,36) = 15.20, p = .0001$, with higher causality attributed to envy rather than revenge. There were no other significant main effects or interactions ($p > .025$).

A similar ANOVA for blame ratings showed a significant group by subjective foreseeability interaction, $F(1,36) = 6.48, p = .015$. The main effect of group was not significant, and there were no other significant interactions involving group ($p > .025$); there was a significant main effect of subjective foreseeability, $F(1,36) = 18.50, p = .0001$, with high subjective foreseeability rated more blameworthy than low subjective foreseeability. The groups therefore did not show the expected difference in sensitivity to motive, although there was a significant main effect of motive, $F(1,36) = 27.54, p = .0001$, with envy rated more blameworthy than revenge. As expected, the groups did not differ in sensitivity to objective foreseeability; the main effect of this was not significant, nor any interactions ($p > .025$).

A post-hoc t-test comparing the groups on blame difference scores for high and low subjective foreseeability, averaged across objective foreseeability and types of motive, showed that contrary to prediction, the AS group differentiated more rather than less than the controls between high and low subjective foreseeability, $t(36) = 2.55, p = .015$ (see Table 2).
Clinical Executive Tests

Working memory performance on the Letter-Number Sequencing test was compared for the AS and control groups using a t-test. The groups did not differ significantly, \( t(33) = 0.74, p = .464 \). Similarly, comparison of interference control errors on the Colour-Word Interference test also showed no significant effect of group, \( t(33) = 1.32, p = .197 \) (see Table 2).

### Table 2 Mean scores and standard deviations for causal reasoning

<table>
<thead>
<tr>
<th></th>
<th>Asperger group Mean (SD)</th>
<th>Control group Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Causal intentionality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratings (range 1–4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intentional cause</td>
<td>3.11 (0.61)</td>
<td>3.26 (0.39)</td>
</tr>
<tr>
<td>Unintentional cause</td>
<td>2.81 (0.45)</td>
<td>2.81 (0.47)</td>
</tr>
<tr>
<td>Physical cause</td>
<td>3.11 (0.37)</td>
<td>2.97 (0.39)</td>
</tr>
<tr>
<td>I-U difference score</td>
<td>0.31 (0.77)</td>
<td>0.46 (0.40)</td>
</tr>
<tr>
<td>IU-P difference score</td>
<td>−0.15 (0.44)</td>
<td>0.07 (0.36)</td>
</tr>
<tr>
<td>Intentional blame</td>
<td>3.73 (0.28)</td>
<td>3.48 (0.48)</td>
</tr>
<tr>
<td>Unintentional blame</td>
<td>2.51 (0.53)</td>
<td>2.74 (0.54)</td>
</tr>
<tr>
<td>Physical blame</td>
<td>2.79 (0.41)</td>
<td>2.95 (0.43)</td>
</tr>
<tr>
<td>I-U difference score</td>
<td>1.22 (0.55)</td>
<td>0.74 (0.65)</td>
</tr>
<tr>
<td>IU-P difference score</td>
<td>0.32 (0.34)</td>
<td>0.16 (0.42)</td>
</tr>
<tr>
<td><strong>Causal foreseeability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High subjective, high objective cause revenge</td>
<td>80.38 (28.51)</td>
<td>84.31 (26.76)</td>
</tr>
<tr>
<td>High subjective, high objective cause envy</td>
<td>91.78 (22.25)</td>
<td>93.61 (15.70)</td>
</tr>
<tr>
<td>High subjective, low objective cause revenge</td>
<td>84.88 (24.38)</td>
<td>85.00 (25.03)</td>
</tr>
<tr>
<td>High subjective, low objective cause envy</td>
<td>88.08 (24.79)</td>
<td>94.03 (11.86)</td>
</tr>
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<tr>
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<td>89.58 (23.51)</td>
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<td>93.61 (12.70)</td>
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<td>88.75 (22.50)</td>
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<tr>
<td>Control of interference errors</td>
<td>1.74 (2.42)</td>
<td>0.76 (1.95)</td>
</tr>
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</table>

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\( ^a \) NB Scores for individual scenarios were averaged for each individual to produce the composite scores shown, as described in Methods above. Mean scores shown for the groups therefore represent means of these composite scores.

\( ^b \) \( N = 19 \) for AS group, \( N = 17 \) for control group.
also not significant (all \( p > .05 \)). Correlations between the main experimental measures and Full Scale IQ were also found to be non-significant for both groups (all \( p > .05 \)).

**Discussion**

This study compared participants with AS and matched controls on two causal judgment tasks. It was predicted that those with AS would show reduced sensitivity to intentionality and subjective foreseeability, linked to deficits in mentalising in AS. In fact, the converse pattern was found for both tasks. In the causal intentionality task, people made cause and blame judgments in relation to chains of events involving intentional and unintentional human actions and physical events. When assigning blame, those with AS were influenced more strongly than the control participants by the intentionality of human actions. In the causal foreseeability task, the effects on cause and blame judgments of varying foreseeability in relation to intentional actions were assessed. This showed that in assigning blame, the AS participants made greater distinctions between actions that the agents believed to be subjectively likely to lead to negative consequences versus those that they did not.

What determinants of similarities and differences in patterns of performance between AS and control participants can be identified for these findings? It is noteworthy that any performance differences between the two groups were confined to social judgments relating only to mentalistic factors, namely blame (but not cause) ratings for intentional versus unintentional actions, and for high versus low subjective foreseeability. In all other respects, judgments made by those with AS were comparable to those of control participants. Thus, for blame the two groups were similar in human versus physical comparisons in the intentionality task, and in comparisons of objective foreseeability and type of motive in the foreseeability task. Moreover, for cause judgments the two groups made comparable judgments for all comparisons. This suggests preservation of at least some aspects of social judgment in AS, consistent with findings showing that children with autism/AS can make some mentalistic distinctions, such as distinguishing between good or bad actions or motives (Grant et al. 2005; Leslie et al. 2006).

Is the mentalistic nature of the judgments the critical factor underlying any group differences between the AS and control participants? Differences were not predicted for the human versus physical comparisons in the intentionality task, since this type of comparison does not require finer-grained understanding of mentalistic issues such as those involved in differentiating intentional and unintentional human actions. A strong bias towards attributing greater responsibility to human actions has been repeatedly demonstrated in neurotypical participants (e.g. Gilbert and Malone 1995; Morris et al. 1999; Naquin and Kurtzberg 2004; Lagnado and Channon 2008) and has been found to be preserved in those with frontal lesions (Channon et al. 2010b). Differences between the groups were also not predicted for comparisons involving objective foreseeability, since these relate to factual differences in the probability of an outcome. This contrasts with the mentalistic nature of subjective foreseeability judgments, which require appreciation of protagonists’ internal beliefs. Differences between the groups were expected for blame judgments of motive, which also draw upon mentalistic beliefs. It is unclear why these were not found, since the motives were sufficiently different to influence judgments in both groups, but this may reflect the fact that both motives were essentially negative, rather than contrasting good and bad motives.

Assigning blame may also be said to involve mentalistic considerations, at least when human actions are involved. Differences between the groups in the present study were limited to blame rather than cause judgments. However, the findings suggested that cause judgments as well as blame judgments may have been influenced by mentalistic factors. Thus, both the AS and control groups in the present study were similarly influenced by intentionality in their ratings of cause for the intentionality task, giving higher ratings for intentional versus unintentional human actions, although in effect these were causally equivalent. Similarly, in the foreseeability task, cause ratings did not differ on the basis of subjective/objective foreseeability for either group, but both groups rated envy motives as having greater causal influence than revenge, although again these had equal causal effect. These findings therefore appear to suggest some appreciation of mentalistic factors in relation to cause judgments in the AS group. Lagnado and Channon also reported effects of mentalistic factors on cause judgments as well as blame judgments in neurotypical participants. Effects of intentionality and motivation on cause ratings (in addition to blame ratings) are consistent with models of causation such as those of Shaver (1985) and Alicke (2000), which encompass both physical and mentalistic factors. Alicke’s (2000) model of blame attributions posits that negative events often trigger a spontaneous emotional response, which can drive a desire to blame. These spontaneous emotional responses not only bias perception of blame, but can also lead to adjustments in the perception of cause.

In considering explanations for the above findings, it is useful to consider how the current literature informs our understanding of social judgment. Recent work has suggested that social and emotional processes interact with more abstract executive skills in contributing to moral
judgment (see e.g. Haidt 2001). A body of functional imaging studies has indicated that cognitive and emotional contributions to moral reasoning are mediated by separable networks in the brain (see e.g. Greene et al. 2004, 2008; Moll et al. 2001). A study by Buckholtz et al. (2008) reported the involvement of emotional networks in decisions about how much punishment to award, and the involvement of cognitive control networks in decisions about the degree of criminal responsibility for actions. Of particular relevance to the current study are findings that scenarios involving intentional harm produced greater activation in areas linked to emotion than those involving unintentional harm (Borg et al. 2006). The subjective perception that someone would cause harm activated regions involved in mentalistic processing, especially when no harm was actually caused (Young et al. 2007). Thus, social judgments in the present tasks may draw upon both social/emotional processes including mentalising, and cognitive processes including executive skills.

How might these processes contribute to the current findings? Focusing first of all on mentalising, AS is known to be linked to difficulties in taking others’ perspectives (e.g. Happé 1994; Joliffe and Baron-Cohen 1999), and this provides a potential explanation of the group differences on blame judgments on the intentional-unintentional and high-low subjective foreseeability judgments found in the present study. However, if these are attributable to impaired mentalistic understanding in the AS participants, we need to explain why they showed greater rather than lesser responsiveness to these differentiations, since impaired mentalising skills might be expected to be associated with blunted sensitivity to such distinctions. One possible explanation is that the AS participants were placing greater reliance on executive skills in judging blame, and that these judgments were not tempered by social and emotional processes to the same extent as those of control participants. This would suggest that reasoned allocation of blame relating to intentionality and subjective foreseeability might be more black-and-white in those with AS than in control participants, where reasoned judgments might interact with emotional factors, leading to more moderate attributions. Channon et al. (2010a) also found enhanced rather than reduced sensitivity to mitigating and exacerbating factors in AS when examining sympathy judgments for drivers after car accidents.

Could the current findings be explained instead by differences in executive or general reasoning skills between the groups? Previous research has tended to find intact interference control and working memory in those with autistic spectrum disorders, although some impairment has been reported for other aspects of executive functioning, such as set shifting and planning (see e.g. Hill 2004; Ozonoff et al. 2007 for reviews). There was no evidence of group differences in WTAR IQ nor on the executive tasks examined in the present study, nor any significant correlations between these and blame judgments. There is thus little indication that differences in executive skill account for the more extreme blame ratings given by the AS participants, unless the executive tasks employed were not adequate to test this. It is also of interest that the groups did not differ significantly across all judgments, but only those relating to intentionality and subjective foreseeability, involving blame but not cause. The most apparent differences relate to the mentalising demands of the particular judgments that differentiate the groups. For example, in the foreseeability task, judgments of subjective and objective foreseeability are logically equivalent, but may make different resource demands since only the subjective judgments pertain to the state of mind of the agents. An account of group differences in terms of general reasoning or executive processes is therefore unconvincing.

Another consideration is that social judgments made by those with AS may place greater reliance upon the rigorous application of learned social rules for guidance, a thinking style often observed in AS (see e.g. Frith 2003; Howlin 1997). Over-reliance on the rigid implementation of learned rules rather than more mentalistic or intuitive interpretations based on subtle nuances of the context could account for the more extreme blame judgments in those with AS in the present study. One important determinant may be the degree of salience of the mentalistic processes influencing the characters’ actions, since this may reduce the need for mentalising. For both tasks used here, intentional and motivational descriptions were made salient by clearly spelling them out, and thus it was unnecessary to work these out from scratch. Those with AS may be drawing upon reasoning strategies linked to executive skills in order to apply social rules in a systematic way, leading to judgments that could be considered more objective, albeit less sympathetic in some circumstances, than those of controls. Further studies manipulating degree of salience and also examining the effect of familiar versus unfamiliar situations, where relevant social rules are not readily available, may therefore be useful in elucidating these issues.

In summary, the present study has found evidence that social judgments in AS are in many ways similar to those of control participants, but that the AS participants show heightened sensitivity restricted to mentalistic judgments involving the intentionality and subjective foreseeability of human actions, and to blame rather than cause. It would be of interest to explore further the hypothesis that difficulties in mentalising may be linked to greater reliance on executive skills and/or learned social rules; and that this in turn potentially leads to altered sensitivity to mentalistic factors, expressed either through enhanced or reduced differentiation in judgments.
Acknowledgments We are grateful to the ESRC for supporting this research (grant reference RES-000-23-0959).

References


Mothers’ Challenges in Feeding their Children with Autism Spectrum Disorder—Managing More Than Just Picky Eating

Laura G. Rogers · Joyce Magill-Evans · Gwen R. Rempel

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Abstract Mothers’ perspectives of the processes involved in addressing the feeding challenges of children with autism spectrum disorder (ASD) were explored qualitatively. The research question was: What is the process of mothers’ feeding their children with an ASD who have feeding challenges, and specifically what is the nature of these challenges? Data were from semi-structured interviews with 11 mothers of 12 children with ASD ranging from 4–11 years. This grounded theory study used constant comparative analysis in developing categories to define the processes mothers used in understanding and then meeting the feeding needs of their children with ASD. Four feeding processes emerged from the analysis. 1) recognizing the feeding challenges, 2) defining the underlying nature of the feeding challenges, 3) seeking support for and validation of the feeding challenges, and 4) staging their approach. The feeding challenges had three different patterns of onset and went beyond typical picky eating behaviors.

Keywords Autism · Picky eating · Feeding · Eating behavior · Grounded theory
“I’m Worried About His Health. How Can He Stay Alive Eating Two Foods and Drinking Water?”

Many typically developing young children enter a stage of picky eating and fear of new foods as they gain independence from their mothers (Carruth et al. 1998). Feeding challenges are reported in 25–35% of typically developing young children (Lewinsohn et al. 2005; Linscheid 2006; Palmer and Ekvall 1978). This stage of picky eating can often include food refusal, difficulty accepting new foods, behavioral feeding problems, tantrums and slow eating. Determining if and when children’s feeding challenges are beyond the level of picky eating is difficult and even more so for children with autism.

Many children with developmental delays (33–80%) have feeding difficulties (Palmer and Ekvall 1978) including aversive feeding behaviors (Schwarz et al. 2001), and are rarely labelled as simply picky eaters. Aversive feeding behaviors include oral hypersensitivity, preferences for specific food textures, and food refusals (Schwarz et al. 2001). These children have diagnoses such as cerebral palsy or syndromes such as Down Syndrome. Early feeding difficulties can cause learned feeding aversions. For example, if children have gastroesophageal reflux, they can continue to refuse foods even after the reflux has resolved (Field et al. 2003).

For children specifically diagnosed with an autism spectrum disorder (ASD), (Centers for Disease Control and Prevention 2010) 46–75% have feeding, eating and mealtime challenges (Ledford and Gast 2006). These children may inadvertently be classified as simply picky eaters. However, in a clinical study of 138 children with ASD aged 7 to 9 ½ years and a same aged control group (n=298), children with ASD had challenges that differed from those of their typically developing peers (Schreck et al. 2004). They were restricted by food category and texture and refused foods more. Parents reported more general feeding problems as their children with ASD had a narrow repertoire and required specific food presentations with specific utensils. The problems were not transient, requiring long-term follow-up and support for parents in dealing with significant mealtime challenges. Children with ASD also have more mealtime challenges than their typical siblings (Johnson et al. 2008; Nadon et al. 2011). These mealtime challenges included not staying seated at mealtimes, not eating with the family, eating less than 20 foods, and having phases of persistently wanting the same foods (Nadon et al. 2011). Cornish (1998) indicated that children with ASD who have a repertoire of under 20 foods and are under 5 years of age are at particular risk for nutritional difficulties and require monitoring. A dramatic example is vision loss in a child with ASD due to a vitamin A deficiency (Uyanik et al. 2006).

Several studies have reported the range of feeding challenges experienced by those with autism (Ahearn et al. 2001; Kerwin et al. 2005; Kuschner et al. 2005; Lukens and Linscheid 2008; Matson and Fodstad 2009b; Schreck et al. 2004; Schreck and Williams 2006; Seiverling et al. 2010; Twachtman-Reilly et al. 2008). In a systematic review, Ledford and Gast (2006) identified seven descriptive studies with a total of 381 children with ASD that reported challenges including limited food repertoire often to the point of nutritional compromise; food refusal; food jags; inflexibility related to food presentation, utensils, dishes, brands and packaging; sensory issues (taste, texture, and smell sensitivities); mealtime behavior issues;
difficulty accepting new foods; and nutritional issues. Less common issues included oral motor problems, consumption of non-edibles, difficulties accepting medicine, and food retention in the mouth. In a later study, Johnson et al. (2008) reported idiosyncratic refusal of foods based on colour, texture and food type. In a study of parent feeding practices for children with feeding challenges, the children with ASD had food refusal, texture selectivity, a narrow range of foods, and oral motor delays (Williams et al. 2008). Adults with intellectual disabilities and autism had more severe feeding and mealtime challenges than those with intellectual disabilities without autism (Fodstad and Matson 2008).

Considering the potential serious consequences of feeding and mealtime difficulties in ASD, it is alarming that there is not more emphasis on their feeding difficulties (Matson and Fodstad 2009a). Matson and Fodstad reported that even when children with ASD have adequate nutrition, feeding challenges can arise when there is limited access to preferred foods at special occasion meals or restaurants. The World Health Organization (WHO) management recommendations for children with ASD include the need to address feeding difficulties (World Health Organization 2004). The nature of the feeding disorders over time and appropriate management strategies for the range of feeding difficulties in ASD have not been well researched.

In summary, while feeding challenges are common in typically developing young children, the proportion and severity of feeding challenges are greater in children with developmental delays and particularly high in children with ASD. Children with ASD are a heterogeneous group and the nature of their feeding disorders is multifaceted. While responsibility for feeding and nurturing a child within a family belong to mothers, fathers, and other caregivers, this study focuses on mothers as they often have the primary responsibility for determining strategies to support successful feeding (Carruth and Skinner 2001). Given the high prevalence and severity of challenges, it is important to understand how mothers manage this essential life task.

**Purpose of the Study**

This study explored qualitatively the processes involved in addressing the feeding challenges of young children with ASD from the mother’s perspective. While descriptive studies have provided information on the types of feeding challenges, no studies have investigated how the feeding challenges develop and change, and what mothers do to ensure that their children with ASD are fed adequately over time. There is support from the literature recommending more investigation of clinical approaches (Ledford and Gast 2006) and use of qualitative methodologies when defining evidence based practice (Strong 2003). In this paper, feeding challenges do not include anorexia or obesity.

**Research Question**

The research question guiding this qualitative study was: What is the process of mothers feeding their children with ASD who have feeding challenges, and specifically what is the nature of these challenges?
Methods

Recruitment

Data were obtained from 11 mothers of children with ASD who had feeding challenges. At the outset of the study, inclusion criteria specified biological mothers of six and seven year old children with a confirmed diagnosis of ASD. Children this age have transitioned to different stages of food textures and types as this typically occurs by age three (Evans-Morris and Dunn-Klein 2000) and they have typically been exposed to eating in different environments (e.g. school). As the study progressed mothers of younger and older children were recruited in order to expand emerging code categories. Mothers who did not speak English and/or whose child had a co-morbid physical condition known to independently affect feeding were excluded. Recruitment occurred via an Autism Clinic database; the ASD diagnosis having been made by an interdisciplinary team. There were 17 responses to 174 recruitment flyers. The first author conducted a phone screening of respondents. Five did not meet the study criteria (2 were fathers, 1 was a foster mother, and 2 children had co-morbid medical conditions), and 3 did not follow-up after the initial phone contact. This resulted in 9 participants. Two other mothers, who met inclusion criteria, heard about the study and were included. Ethics approval was obtained from the Health Research Ethics Board.

Participants

The participants were 11 mothers of 12 children with ASD. Two mothers parented one child, six parented two children, two parented three children and one had four children. Six mothers had intensive parenting roles as one mother had two children with ASD, three mothers had another child with a disability, and two were caring for infants. Three mothers had another child in the family who was a “picky” eater. While data were not collected on family income, three mothers indicated that there were financial challenges related to providing food for their child with ASD due to the need for expensive packaged food, reliance on “fast food” or because of the amount of food provided and not consumed. One family received government financial support for special formula (Table 1).

The children with ASD ranged in age from four to ten years. There were 11 boys and one girl, including two brothers. To preserve anonymity of the one girl, all quotations refer to the male gender. The children spanned the autism spectrum with approximately half classified at time of diagnosis as having higher functioning autism and one with Asperger’s Syndrome. The other children were either severely

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Demographics of the 11 mothers</th>
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<tr>
<td>Ages</td>
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<tr>
<td>Education</td>
<td>Grade 7 to University; 6 had University degrees</td>
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<tr>
<td>Marital Status</td>
<td>9 married; 1 single mother divorced; one blended family</td>
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<tr>
<td>Work</td>
<td>7 homemakers; 2 worked full time; 2 worked part time</td>
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<tr>
<td>Ethnicity</td>
<td>10 Caucasian Canadian; 1 African Canadian</td>
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or moderately-to-severely affected in the areas of language, cognition and/or behavior. The feeding difficulties did not appear to be directly related to the severity of ASD symptoms, as one child with severe symptoms had the least feeding problems while the highest functioning child had the most feeding challenges.

Data Collection and Analysis

The primary form of data collection was through single 1 ½ to 2 ½ h semi-structured interviews conducted by the first author between September 2008 and June 2009. Interviews were recorded and transcribed verbatim, and field notes were documented after each interview. In keeping with the grounded theory process, data collection and analysis occurred simultaneously, with the data analysis commencing after the first interview and as each subsequent interview was completed (Charmaz 2006). Data analysis included initial line by line coding and then progressed to focused coding (Bowen 2008; Charmaz 2006). Through a constant comparative analysis process new data were compared with previous codes, theoretical concepts were developed and relationships were formed (Bowen 2008; Glaser 1992). Memos were written to explore ideas about codes and categories, and reflect on the data, create concepts, and conceptualize the emerging processes (Charmaz 2006; Liamputtong and Ezzy 2006; Schreiber and Stern 2001). Nvivo 8 qualitative software was used for data management, data sorting and retrieval (QSR International Pty Ltd. 2008).

Rigor

Rigor was enhanced through congruence among research question, methods, data collection, data analysis, and the subsequent development of social processes (Richards and Morse 2007). Fit was ensured through allowing the concepts to emerge from the participants’ experiences rather than forcing data into preconceived categories, and through situating the findings within the literature. Relevance was attained through the linking of the relationships among the data and within the existing evidence base (Charmaz 2006).

Results

Four core processes emerged from the data: 1) recognizing the feeding challenges, 2) defining the nature of the feeding challenges, 3) seeking support for and validation of the feeding challenges and 4) staging their approach.

Recognizing the Feeding Challenges: “You Wake Up and Realize He’s Only Eating Five Different Foods”

Mothers described a process of attempting to feed their children and encountering difficulties. There were three patterns of onset. As the children got older, their children became more limited in repertoire, and the mothers tried to sort out what was typical and what was cause for concern.
Patterns of Onset Some of the mothers recognized their child’s feeding challenges from birth including difficulty with breast feeding or acceptance of different formulas. As one mother reported, “breastfeeding was horrible, wouldn’t work. He didn’t suck very well. We went around the block on the formulas.” Feeding problems persisted as the child got older and had difficulty with progression to different food textures and acceptance of new foods.

Another reported pattern of onset was that the child’s feeding progressed typically until 12–24 months, when the number of foods gradually diminished to a limited repertoire of foods. This often coincided with the first onset of symptoms of ASD. A mother described this process:

He’s a dream baby. He’s eating everything. Then, I can remember the day—it’s imprinted, tattooed on my mind and he hadn’t eaten his lasagne. He’s always enjoyed it. For some reason that day … things started changing with his eating. He was a kid who ate everything. … Then more food started dropping off his list.

A third pattern of onset was a combination of the other two patterns. These children had feeding problems from birth which resolved. They then started losing foods at 12–24 months. All children therefore had a significantly reduced repertoire of foods by ages two to three years.

Beyond Picky Eating Irrespective of the onset pattern, the mothers described a tumultuous and confusing process of trying to feed children with severe reactions to foods. In this difficult phase when the child was two to three years old, they were trying to get nutrition into their child and sort out what was typical picky eating behavior and what was a more significant feeding issue. During this phase mothers tried to get food into their child in any way possible, often having to cater to the child’s preferences, since “if you ever saw those meltdowns you wouldn’t want to offer [non-preferred] food either.” Many children were down to three to five foods at age three to four years.

Three mothers had other children without ASD who were also picky eaters. This gave insight into their perceived difference between a typical picky eater and a child with ASD.

Just remember that it’s not a picky eating thing; it’s not even a really picky eating thing. It’s a whole different thing and you have to wrap your head around that. … It’s not the same as our daughter [without ASD], it’s a different situation. … You can tell on that day, at that time, eating that [food] is not physically possible for [son with ASD]. It’s like he would rather be miserably hungry than eat that. … So to me that’s the difference. She can eat it, but she chooses not to, but for him he physically is unable to eat something and mentally he can’t. To him eating that [food] is like the most revolting thing being offered to you or me. What if it’s just mentally, emotionally, sensory-wise just impossible for him to cross that threshold today? So I think you have to remember it’s not a choice they’re making.

Interestingly, mothers all used an analogy to explain their child’s feeding issues, such as “what if it’s like saying ‘drink this cow’s blood’?” Saying that children with ASD will eat when they are hungry is like “handing somebody a bowl of dandelions
and saying, ‘well if you’re hungry you’ll eat that’ … Oatmeal is his dandelions … It’s disgusting to him. That’s not his fault.” “As far as he is concerned at that moment [food] is a rotten rat. His perspective is his reality.”

**Restricted and Narrowing Repertoire** Food refusals resulted in difficulties achieving a food repertoire to achieve adequate intake and nutrition. All the children had specific preferred foods and refused non-preferred foods to the point of not eating and even hospitalization for two children when presented with only non-preferred foods. Four mothers described times when their child was underweight and did not follow their growth curve. All 12 children were missing or had a reduced repertoire in at least one food group. Many of them had a restricted repertoire in two and even three food groups.

Defining the Nature of the Feeding Challenges: “He Gags at the Smell of Food Cooking”

All of the mothers went beyond the specific feeding behaviors to figure out what was going on for their children. They were convinced that their children were not to blame, that it was not “just a behavioral issue.” The children had a variety of feeding challenges and the mothers tried to determine the source of the problems.

**Sensory Differences** Mothers described sensory aversions relating to the sight, smell and texture of foods, and sensitivities to seemingly small alterations to taste. “He’ll gag and almost get physically sick just watching us eat something like spaghetti and meat sauce. He “dry heaves when he looks at pasta.” One child had such an extreme reaction to smell that she was unable to cook meat when he was at home. She had to return home from a family Christmas gathering as he was vomiting in the backyard when the turkey was cooking.

**Need for Sameness** Some feeding challenges were related to characteristics of ASD such as “need for sameness” and lack of flexibility. Children required certain brands of foods and were particularly sensitive to changes in food taste and presentation. Mothers reported that there was a risk of losing foods if preferred foods were altered in some way. There were instances of children no longer accepting preferred foods if attempts were made to, for example, hide ham in their grilled cheese sandwich. The child would not just refuse that grilled sandwich, but refused to eat grilled cheese sandwiches again. In an extreme example, a five year old child who relied on Pediasure for his nutrition refused to accept the formula again when the bottle was removed over a weaning week. He never returned to drinking Pediasure, even two years later, as he refused to accept it in any other vessel.

**Food Jags** A food jag is when a food is accepted well for a time, sometimes to the exclusion of other foods, and then suddenly the child will no longer accept it. A mother remarked that she “doesn’t know how he can live on so little food. There’s jags where he doesn’t want anything but jam sandwiches.” Further, he was inconsistent since “just because he ate it Tuesday doesn’t mean he’ll eat it Wednesday or Thursday.” Part of the challenge for mothers was to sort out what
was a typical picky behavior of a two year old, for example, and what was atypical and requiring further attention.

Behavioral Challenges Some children displayed problem behaviors. These included having difficulty sitting at the table to eat, throwing food, grazing and not having a feeding routine, and taking food from others’ plates. “My younger children won’t eat the food they don’t like, but [my son with autism] won’t even come to the table.” Mothers explained some of the reasons behind the behaviors. The children who threw foods often had severe aversions. Even verbal children were unable to express their need to avoid the food in their overwhelmed state. Some children were unable to sit at the table for any activity, including eating, or until they received more supportive seating. For the children without a feeding routine, the mothers were working on their use of language to request food. The goal of language superseded the goal of a mealtime routine.

Co-morbidities Co-morbidities affecting feeding included generalized anxieties, food sensitivities, lactose intolerance, and gut issues such as pain, diarrhea, and constipation. Some children also had oral motor problems, chewing difficulties, hoarding of food and mouth-stuffing. Others had significant challenges with appetite and feeling and responding to hunger cues.

These feeding challenges significantly affected home life, family mealtimes and eating in other environments where, for example, it was not unusual for the children to have only one to three foods they would eat at school. Mothers described the dilemma of meeting their child’s needs or the expectations of relatives at family gatherings. Trying to feed the child while on family vacation affected the whole family.

Seeking Support for and Validation of the Feeding Challenges: “When I Say He Doesn’t Eat, He Doesn’t Eat”

This study took place in a city where there was access to specialized feeding consultation. Unfortunately mothers who sought support from health care professionals perceived that their feeding concerns were often dismissed and they were left on their own to manage. In particular the mothers were frequently advised to present the family meal and that their children would eat when they were hungry. Mothers reported that if their child was not given preferred foods, they would not eat. Some mothers had difficulty getting medical problems addressed because the child had a diagnosis of ASD. One mother felt that symptoms were viewed and perhaps even dismissed by medical professionals as behavior problems due to autism. She wept as she described finally getting the diagnosis of gastro-esophageal reflux:

[My son] would cry night and day, and he could not talk to me. I know he has pain, but when the doctors tell you there’s nothing wrong with him, what do you think? … Finally I really put my foot down and told the doctor “Don’t look at his autism; look at him as not autistic and then look at the problem, it is a throat problem”, and they gave him a scope and then they found the reflux, it burned him really bad. It took three years to be diagnosed.
Another mother sought medical help for her son’s “gut” issues and felt dismissed. She perceived that the autism diagnosis prevented her son from being treated as a child with a physical illness. Another mother had to deal with her son’s severe constipation on her own. Many mothers felt that their feeding issues were not treated as important and being typical of toddlers, even though they recognized their seriousness.

I had taken him to doctors and I’d been, like, “Look at him. He looks terrible.” He was losing weight, “He doesn’t eat”; [and the doctor] said “Oh, well, my kids didn’t eat, either.” “No, no, no. When I say he doesn’t eat, I mean he drinks milk out of his bottle all day; that’s it. He doesn’t eat.” “Oh, they’ll eat when they’re hungry”— all those things that you hear. And I was just sick, because I was, “Look at my child. He is basically dying in front of my eyes.”

When she sought help at the hospital, [The doctor] put him on Pediasure. They said, “You have 2 weeks. Be back here in 2 weeks. If he has not gained weight, we will admit him. They will put a tube in,” and they were really worried … ‘cause his hair was brittle; he was malnourished, completely. They classified him as “failure to thrive.” … It was very scary.

While some families were eventually supported through specialized feeding clinics, getting a referral to the clinic was often challenging or discouraging. One mother described being told nothing could be done to improve her son’s feeding. “I was basically told to deal with it. And then told his nutrition will be, like crap.” Like many of the other mothers, she then proceeded to figure out on her own how to approach the feeding challenges.

Staging Their Approach: “I Basically Try to Follow My Own Instincts”

Mothers stated that they were guided by their desire to follow their child’s lead and they all used a gradual approach to implement individualized feeding approaches and strategies.

Initially Ensuring Adequate Intake The initial months and first two or three years were devoted to figuring out their child’s issues and finding ways to ensure adequate intake. Mothers reported doing “short order cooking” which they were able to move away from as the children got older. Often between the ages of two and three years they could only give highly preferred foods even though the feeding repertoire continued to diminish. This early stage was characterized by significant stress for both mother and child. The emphasis was on finding a way to feed the child without causing distress. This was not a time for increasing repertoire or having a balanced diet. Instead the focus was on finding and keeping foods the child would eat. The length of this phase varied and typically lasted until the child was at least three years old. By then mothers usually sensed what might or might not work as they addressed the ongoing feeding challenges.

Moving Beyond Intake All mothers moved into the phase of finding ways to increase the child’s nutrition. They had creative ways of adapting meals that their children would eat to both increase nutrition and palatability specific to the child’s needs.
Many mothers loaded accepted foods with hidden nutrients. “I put a whole bunch of stuff in his waffles.” They continued presenting foods in their pure form and they used inconspicuous deception. Any noticeable difference detected by the child resulted in non-acceptance of the modified previously accepted food.

*Increasing Repertoire* Once the mothers ensured adequate nutrition through diligent effort, they actively engaged in increasing the child’s repertoire and variety of foods changing and continuing their work on other aspects of the feeding process such as sitting at the table to eat.

**Discussion**

Mothers have valid concerns when their children with ASD have feeding challenges that do not respond to typical feeding approaches. These feeding challenges affect the child, parents, and family mealtime and to date have only been described in terms of one point in time (Ledford and Gast 2006). This study specifically asked mothers to describe challenges over time, resulting in a better understanding of the processes involved. The findings from this study also add to the existing literature in several ways: 1) many children with ASD have feeding behaviors that go beyond picky eating, suggesting clinicians need to consider interventions that are beyond those used with typical picky eaters, 2) the need for more individualized interventions based on types of challenges is clearer, 3) an additional pattern of onset not currently described in the literature and requiring further investigation was identified, 4) processes that mothers engage in when trying to determine the nature and extent of their child’s feeding problems were described, and 5) mothers encountered system-wide access difficulties in getting their feeding concerns recognized.

Feeding challenges in ASD extend far beyond what is seen with typical picky eaters. The children have more feeding challenges than their typically developing peers (Schreck et al. 2004) and more mealtime challenges than their siblings (Nadon et al. 2011). Further investigation is required to determine if mothers facing these challenges use strategies for typical picky eaters, (Satter 1987) and find the strategies ineffective. Such strategies include recommendations to wait children out as they will eat when they are hungry, and to present the family meal instead of including some of the child’s preferred foods. This study suggests that these strategies were not effective for these children with ASD. Additionally this study demonstrated that, if ignored, there can be significant nutritional issues and possible hospitalization. It was a balancing act for mothers to meet the nutritional needs of their children, knowing that they could risk losing the limited foods in the child’s diet if they altered them or made changes too quickly.

These issues point to the need for early and comprehensive medical investigation to determine if medical issues are contributing to the negative feeding behaviors for children with ASD. Researchers advocate investigation of childhood feeding difficulties for all children in general, even in absence of a diagnosis to see if there is a medical component (Field et al. 2003; Lewinsohn et al. 2005). Many feeding
problems result from the interaction of medical, congenital, and developmental issues which affect child and caregiver behavior (Field et al. 2003). Even parent magazines that purport to have all the answers for feeding picky eaters recommend that parents document concerns and seek further medical input if the child is missing a whole food group or has extreme physical or emotional reactions to foods (Reynolds 2011). In our study medical investigations were not provided for some children despite repeated requests from their mothers. Our study also indicated a need for assessment and intervention beyond a medical assessment, including a dietary assessment if there are growth and nutritional challenges. Only four children in this study had growth challenges while all had nutrition challenges. Adequate growth can be misleading as the mothers reported adequate growth was used to reassure them that there was no cause for concern. However failure to thrive in early infancy coupled with atypical feeding problems has also been identified as a red flag for underlying diagnoses, including autism (Keen 2008).

Mothers clearly articulated the multifaceted nature of the feeding challenges that their children faced. What makes things more difficult from an assessment and intervention perspective is that each child had a different combination of the challenges described by the mothers and in the literature to date (Ledford and Gast 2006). All had difficulties accepting new foods and had a limited food repertoire, some to the point of nutritional compromise. Some children had sensory issues with food, others were affected by rigid behaviors and a need for sameness. Some had oral motor difficulties and low muscle tone which influenced their ability to handle textures of foods, while others could not tolerate different food textures from a sensory perspective. Others displayed significant behavioral challenges often as a result of not being able to explain their aversions due to communication difficulties. Ahearn et al. 2001 emphasized the importance of including environmental factors in investigating mealtime behaviors for children with ASD. Schreck and Williams (2006) found that food selectivity in children with ASD was positively related to food selectivity of the family. Family eating patterns need to be considered in evaluation of feeding challenges. Williams et al. (2008), in studying parent feeding practices of children with feeding problems including those with ASD, surmised that one interpretation of their correlational data could be that parent practices could be a consequence rather than a cause of children’s mealtime challenges. Given all of these factors, it is important to determine the type of feeding challenge in order to target appropriate interventions, as there appears to be a complex set of dysfunctional areas impacting feeding, requiring a multifaceted and even novel treatment approach (Keen 2008).

Given the multifaceted and individualized nature of the feeding challenges, an interdisciplinary team assessment of the complex feeding issues can assist in addressing the specific nature of the challenges. Such an assessment is necessary when the feeding issues extend beyond medical and dietary concerns. An expanded team approach including occupational therapy, speech language pathology, psychology, and others is advocated for many other complex feeding issues, (Evans-Morris and Dunn-Klein 2000) yet for the children in this study, the ASD diagnosis seemed to preclude further evaluation. Researchers have specifically advocated for in-depth assessment of children with ASD who have complex feeding issues (Twachtman-Reilly et al. 2008). Areas to assess include sensory processing issues, gastrointestinal
problems, ritualistic behaviors, planning and sequencing behaviors, need to follow mealtime routines, anxieties, cognitive inflexibility, social and language skills, food selectivity, and patterns of consistency and inconsistency in feeding in different environments (Twachtman-Reilly et al.). The necessity of adequately assessing the nature of the feeding problems rather than just looking at the feeding behavior has been reported. In a study of six cases, all presenting with food refusal, the multidisciplinary team determined that there were six individual and different reasons for the food refusal (Dovey et al. 2010). However, to further complicate both assessment and intervention with these children and families, the children’s feeding also changes over time.

Through evaluating the process of feeding in ASD this study has demonstrated the need to look at time of onset of challenges and change over time. Our study delineated three patterns of onset of feeding challenges. Some children had feeding problems from birth; others started having feeding issues at 12–24 months while others had initial challenges that were resolved, only to have different problems surface at 12–24 months. Cornish (1998) described the first two types of onset in their research. Further research is required to determine the nature of these patterns of onset, their significance, and whether they differ in presentation. This information will further guide intervention approaches and strategies. As time progresses, the feeding challenges present insidiously, as mothers described the gradual loss but sudden awareness and alarm when they realized their child was now severely limited in repertoire. Mothers reported that their children continued to lose foods over time and this is a significant red flag requiring further investigation. Other warning signs included the reduction of food repertoire to exclude one or more food groups, strong behavioral reactions to introducing new foods, and significant mealtime challenges. Attention to such issues has the potential to not only direct intervention approaches, but also possibly prevent further feeding issues. Further research is required to investigate from a physiological perspective what is contributing to the severe reactions that these children have to different foods and to investigate behavioral feeding issues as a result, not as a cause of feeding challenges.

Limitations

While there was considerable interest in this study from service providers and parents, interested participants were not easily reached through the clinic mail-out process. Recruitment occurred during a heavy recruitment phase for other ASD studies through the same database. Nevertheless, the 11 participants provided a diverse sample and rich and meaningful data within the necessary six to twelve interviews minimally required for a grounded theory study (Guest et al. 2006). While the aim of the qualitative research is not generalization, the rich description provided in this study allows the reader to apply relevant concepts to similar populations. This study’s strength of having a group of educated and perceptive women as participants has led to rich description and understanding of the issues, however this is also a limitation. Nothing is known about the mothers who did not choose to participate. All of the participant mothers articulated their intuitive ability to understand and interpret nuances in their child’s behavior. Challenges experienced by mothers who do not have this level of insight were not obtained. This study only represented the
mother’s viewpoint on feeding and information regarding the fathers was only obtained through the mother’s perspective.

Summary

Feeding challenges are but one of the many issues that parents must face when parenting a child with ASD, and it is essential that their concerns be validated and not dismissed as simply part of the diagnosis. Parents need the support of professionals who validate their concerns and come alongside parents in their problem solving of feeding problems that can extend beyond typical picky eating. Such early validation and assessment of the feeding issues will direct the development of appropriate intervention approaches and strategies.

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Interview Guide

1. Tell me about your child (age, influence of ASD).
2. Tell me a bit about your family (siblings, who lives in home).
3. Does your child have any particular medical concerns that affect feeding?
4. Do you have any concerns about your child’s weight?
5. Tell me about feeding your child right now.
   Specific feeding challenges; particular about specific food groups, brands of foods, food presentation;
   • Eating in certain environments (friends/relatives’ homes, preschool/daycare, school)
   • Special occasions/cultural celebrations
   • Meal and snack routine or graze throughout the day
   • Any supplements (vitamins, supplements, Pediasure)
   • Does meeting your child’s feeding needs and nutritional needs cause any significant financial challenges for your family?
6. When did these challenges start?
7. Tell me about your child’s feeding as an infant. Transitions from breast to bottle, bottle to cup, to purees, to lumpy solids, to finger foods, to utensils.
8. Tell me about your child at the following ages: 2, 3, 4, (and other ages if older).
   As issues arose asked:
   • What did you do to try to make things easier? What did you try first?
   • What strategies worked? Who suggested the strategies?
   • How did you make your choices?
   • Were the strategies offered by others helpful?
9. Was there an age when things got worse? What do you think contributed to this? What else was happening in your lives at the time?
10. Was there an age where things became easier?
11. What are the strategies you currently use to feed your child?
12. Do you feel that through these strategies your child has adequate nutrition?
13. Is there anything else that you would like to tell me about your child’s feeding?

References


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