Teaching Children with Autism to Mind-Read

The Workbook

Julie A. Hadwin,
Patricia Howlin and
Simon Baron-Cohen

WILEY Blackwell

Praise for *Teaching Children with Autism to Mind-Read: The Workbook*

"This is a much-awaited revision of Howlin, Baron-Cohen, and Hadwin's 1999 volume *Teaching Children with Autism to Mind-Read* that includes expanded lessons and concepts to teach high-functioning children with autism about mental states. The approach is importantly developmental – based on prior research and progressive sequences of concepts and stages of instruction. It includes multiple foci, including teaching about differences in perspectives, about beliefs, about knowledge acquisition, and more. No one thinks that teaching mental-state understandings will address all the social-cognitive challenges faced by children with autism, but understanding the mental states of self and other is an acknowledged and crucial challenge for these children and young people (and adults) and one that this workbook carefully and effectively addresses. It is a lively and practical book that will be a tremendous resource for parents and educators."

Henry Wellman, Harold W. Stevenson Collegiate Professor of Psychology, University of Michigan

"Without being aware of it we all continuously attribute mental states, such as desires and beliefs, to other people, and in this way we predict what they are going to do next. This is what children and adults with autism cannot do spontaneously. But, years of painstaking research has shown that they can be taught to do it. Clearly, this does not turn them into spontaneous mentalizers, but it does benefit their understanding of the otherwise unpredictable social world.

This *Workbook* contains teaching aids in picture and story form that are bound to inspire teachers. The general approach is to build up a sequence of skills in line with the sequence observed in typical development; from joint attention, to pretend play, to perspective taking, to understanding desire and more complex informational mental states such as knowledge and ignorance, and finally complex second order beliefs (e.g. "he thinks that she believes he is telling the truth"). It is with these complex mental states that the new workbook has expanded most over the previous one.

This manual provides an invaluable source of ideas and techniques on how to teach children and adults with autism about mental states, and it never loses sight of the need to link this teaching to their social skills in everyday life."

Professor Uta Frith, University College London, UK

"The *Workbook* joins the authors' seminal *Teaching Children with Autism to Mind-Read: A Practical Guide for Teachers and Parents* in providing research-based protocols for developing and advancing mentalizing skills and social cognition in children with autism spectrum conditions. It extends the program provided in the book, offering scientifically validated, though clear and simple-to-use, principles for the understanding of informational states, as well as illuminating stories, examples and activities, promoting the generalization of the principles acquired.

The *Workbook* is highly recommended for parents, teachers, and clinicians wishing to base their work on rigorous scientific knowledge of how the understanding of others' minds works, and how it can be improved in children and adolescents on the autistic spectrum."

Dr Ofer Golan, Head of the Child Clinical Program, Bar-Ilan University, Israel

"The difficulties faced by children with autism in understanding the workings of other minds are instinctive and pervade all aspects of social development. This practical workbook applies research that shows that such a developmental approach may be helpful in laying the foundations for reciprocal social understanding. It will be useful to parents and teachers and other professionals working with children with autism."

Richard Mills, Research Director, Research Autism, UK

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Chapter One Introduction

Introduction to Theory of Mind

Individuals with autism spectrum conditions (ASC) have difficulties in social interaction and communication, alongside repetitive and stereotyped behaviors and unusually narrow interests.[1] Social interaction difficulties include indifference or aloofness towards other people, problems understanding and responding to social cues or displaying inappropriate social behavior. For example, individuals with ASC may display less eye contact and make fewer gestures when speaking with others. In addition, they may show atypical body posture or proximity when interacting (e.g., an awkward or unusual gait, or standing too close to another person or talking in too loud a voice). In these situations individuals with ASC often do not have a good enough understanding of the unspoken rules of conversation, or the social norms required to interact effectively with others.

Theory of mind

Effective social interaction requires an understanding of the mental states of others, including their beliefs, emotions, intentions and desires. Theory of mind (ToM) is a term used to encompass an individual's ability to understand mental states in order to make predictions about a person's behavior.[2] A substantial body of research has shown that individuals with ASC show difficulties and delays in understanding the thoughts and feelings of other people and in demonstrating that people can have thoughts and feelings that differ from each other and their own.[3]

Reader's Note: Superscript numbers refer to reference works (see page 137); superscript symbols refer to footnotes.

Teaching Children with Autism to Mind-Read: The Workbook. First Edition.
Julie A. Hadwin, Patricia Howlin and Simon Baron-Cohen.

Understanding false beliefs

One key test of ToM, used many times in research, explores whether children and adults understand that other people can have a different belief to themselves, where this belief can sometimes be false. This level of understanding is referred to as first-order ToM. One method developed to assess ToM used by Simon Baron-Cohen and colleagues in the 1980s is the Sally-Anne task.[4] The aim of this task is to test the age at which individuals understand that other people can hold false beliefs and that their behavior and emotions are related to these beliefs. In this task* Sally puts an object in one location which is later moved to a different location by Anne, without Sally's knowledge. Typical children over 4 years old understand that Sally now has a false belief about the object's location: they recognize that Sally didn't see Anne move the object so she will think it is still in its original location. They therefore predict that Sally will look for the object in the location where she put it (even though it isn't there). By the age of 7 they also understand that Sally's desire and her false belief that she is about to find the object will lead her to feel happy, until she discovers that the object is missing, when she will feel sad.[5]

Almost all typically developing children show some understanding of false belief tasks by the age of 5.[7] The change in thinking about mental states at this stage in development has led some researchers to argue that a conceptual change takes place between the ages of 2½ (the earliest age at which children pass such tests) and 5.[8] The extent to which children show an understanding of false belief earlier or later in development may be a function of their social environment and language development, or perhaps their biology. Links between ToM and language ability have been found in several studies.[9,10] ToM tasks often require children to understand embedded sentences (e.g., Sally thinks that the ball is in the basket) and it is therefore not surprising that language ability is associated with passing these tasks. The direction of this relationship, however, is most likely a reciprocal one: good language skills enable children to interpret information about other people's mental states and beliefs. Conversely, ToM skills serve to facilitate the development of children's understanding of language by thinking about a speaker's intentions and what the listener needs to know.[11]

* The Sally-Anne task was based on a test by Heinz Wimmer and Josef Perner in (1983).[6] There have been many variations of this task using pictures, dolls and people (in real-life settings and video-presented scenarios) investigating whether children understand that they themselves, as well as other people, can hold a false belief. In addition, some tasks ask children to make a belief-based judgment (Where will she go? What does she think?) or an emotion judgment (How does she feel?). Similar tasks include the deceptive appearance task (which tests an understanding that people can hold false beliefs about the contents of a container) and the appearance-reality task (which considers an individual's ability to understand what an object really is and not what it appears to be).

Other research has shown that a relatively early emergence of ToM can reflect a favorable learning environment. For example, children with one or more siblings are more likely to show an earlier understanding of false belief compared with those who have no siblings.[12] In addition, increased parental sensitivity is associated with a better mental state understanding and more positive friendship interactions.[13] Similarly, more advanced ToM tasks are better understood by adults who have more extensive social support networks[14] and children who display better social skills.[15] Taken together, these studies suggest that aspects of a child's environment can facilitate the development of ToM skills and they highlight the interconnectivity between ToM and the development of social skills.

Understanding false belief in individuals with ASC

In contrast to patterns seen in typical development, most children with ASC do not pass false belief tasks until late childhood. A typical error made by young children and children with ASC is that they attribute beliefs to others that reflect the *actual* situation, rather than what someone *believes* to be true. For example, they often predict that Sally will look in the location where Anne has moved the ball. In other words, they fail to understand that because Sally did not *see* the move, she won't *know* its current location. While many older children and adults with ASC eventually pass false belief and other ToM tasks, this is typically after a significant delay. For example, one study found that children with ASC start to show some success in passing false belief tasks when they reach a verbal mental age of around 8 and this ability continues to improve with increasing verbal ability.[16] However, further studies have found that even when children with ASC can pass ToM tasks, they still display a characteristic lack of insight in their day-to-day lives.[17,18] This finding has led some researchers to argue that children with ASC who pass ToM tasks have developed compensatory learning strategies.[19] The poor association between passing ToM tasks and the development of broader social skills has also been demonstrated in several studies. For example, individuals with ASC who were able to pass the Sally-Anne task failed to ascribe mental states or emotions to a pattern of moving geometric animations in the same way as their typically developing peers.[20] Similarly, children with Asperger Syndrome who passed traditional ToM tasks did not show typical spontaneous anticipatory eye movements to the relevant locations in a false belief scenario.[21]

Technological advances over the last 15 years have allowed researchers to locate areas of the brain that are activated during ToM. Using brain scanning methods such as fMRI, PET or SPECT, typically developing individuals show

activation in the medial prefrontal cortex, amygdala and temporal parietal areas of the brain.[22,23] In contrast, these brain regions are under-active in individuals with ASC when performing similar tasks, and instead the brain uses areas that are associated with general problem solving.[24] These findings further support the idea of compensatory learning in ASC.

A developmental perspective

In recent years, researchers have adopted a developmental approach when trying to understand the acquisition of ToM. It is now recognized that ToM involves several skills that emerge across development and is not just indexed by passing false belief tasks. Studies have employed a wider range of tasks that draw on children's abilities to reason about mental states at different ages. In infancy and toddlerhood, for example, early social-based skill deficits in ASC often manifest in poor joint attention.[25,26] Joint attention is the ability to coordinate attention with others to objects and events in the environment, using either gaze or gesture or language. In typical development, joint attention (seen for example in gaze following or the pointing gesture) emerges between the ages of 9 and 14 months.[27]

Desires and beliefs

Further research has proposed that ToM does not emerge as a single cognitive process, but is made up of several interrelated skills including the ability to reason about other people's beliefs, intentions, knowledge, emotions and desires.[28,29] The ability to predict the desires of others emerges prior to the ability correctly to determine their beliefs.[30–33] Accordingly, children understand that two people can want the same toy, before they understand that two people can hold different beliefs about the same toy. Following this, children also understand that two people can hold different beliefs about the same situation, before they come to an understanding that someone can hold a belief about that situation that is false.

Looking beyond false belief understanding, one area of research has considered the development of ToM skills beyond early childhood. Francesca Happé developed a set of "Strange Stories" to assess more advanced ToM skills.[34] These stories rely on a person's understanding of the non-literal use of language as depicted in communicative intentions around concepts such as irony and sarcasm. For example, in the sarcasm scenario the main character comments "Lovely day for a picnic!" (when it is raining outside). The reader is then asked if the person in the story has said something true, and why they said it. Both typically developing children and adults with

high-functioning autism who show no difficulty in passing standard ToM false belief tasks struggle to interpret this type of scenario. Often, it is not until late childhood that children show some understanding of the non-literal use of language in these stories.[35–37]

This broad research agenda stemmed from the development of what has been termed second-order ToM tasks ("thinking about thinking"). These tasks involve reading a story with several characters, where children or adults are asked to comment on what one character thinks another character believes. It is generally accepted that second-order ToM develops at around 6 or 7 years of age.[38] Most typically developing adults show difficulties thinking through scenarios that require understanding beyond third-order ToM tasks. In a recent study, 10- and 11-year-old children were tested up to fourth level ToM.[15] At this age, children passed first- and second-order ToM tasks without any difficulties, but they made significantly more errors in third-order stories, and were equally likely to be correct as incorrect on fourth-order tasks. This study highlights that ToM continues to develop and improve through late childhood and into adulthood.

Teaching ToM to Children with Autism

Since the original publication of *Teaching Mindreading*,[39] theoretical and empirical work has continued to focus on ToM as a factor that underpins the social and interaction difficulties evident in individuals with ASC. A growing number of studies have explored teaching ToM to children and adults with ASC, with most studies focusing on children in late childhood and adolescence.

Studies aiming to teach children with ASC to understand mental states have generally found that children are able to learn to pass ToM tasks and to transfer their knowledge to conceptually similar tasks that have not been directly taught.[40–42] Some studies have found evidence of generalization to novel ToM tasks;[43,44] although demonstrating that children can use new skills to pass novel ToM tasks or in real-life situations has often proven to be problematic.[45]

This lack of generalization has raised questions about what children learn during ToM teaching; do they learn about mental states or have they simply acquired "rules" or strategies for passing tasks that have a reliable and predictive structure and format?[19,46] Despite some of the limitations in this literature, it is still acknowledged that teaching ToM can be useful to

individuals with ASC in order to encourage them to think about mental states; something that they would not naturally do in the course of development. The main aim of intervention is to give children and adults the basic tools to understand mental states in order to help them negotiate their social world.

Several researchers have argued that a *structured* approach to teaching ToM is the most beneficial for learning.[47] In addition, it is suggested that the use of multiple examples within a teaching program can help to foster generalization to new tasks and contexts.[47] Others have proposed that longer-term ToM teaching built into an educational curriculum, or a combination of ToM teaching alongside social skills workshops, would be most beneficial in terms of developing and utilizing ToM skills.[45,48] In terms of approaches to teaching, the majority of studies start teaching at the equivalent to first-order ToM (what a typical 3- or 4-year-old child would understand). Some researchers have proposed that interventions should be targeted at recognized precursors of ToM, such as pretend play or joint attention.[49] Whilst some ToM teaching has adopted a developmental approach, this approach within the broader literature is less common. The Appendix summarizes the main studies that have aimed to teach TOM to children with ASC. The Appendix table shows that researchers have adopted a variety of teaching tasks and approaches. In addition, it shows that different studies have used more or less intensive teaching methods over relatively short or much longer time periods and have included children and adolescents with a range of verbal ability.

An Introduction to the Current Workbook

Children and adults with ASC can be taught to think about mental states. Our initial work led to the development of a book that included examples of emotions, pretend play and perspective taking that could form the basis of teaching ToM to children with ASC.[39] Its aim was to provide a user friendly and accessible source book for teachers and professionals working in the field of autism who wanted to develop structured protocols for teaching ToM to children. Adopting a developmental perspective means that children can start at a very basic level (e.g., playing with objects, linking emotions to contexts, understanding that seeing leads to knowing) and progress to consider more difficult concepts (acting "as if" one object is another in play, understanding individual perspectives in emotion, recognizing false beliefs and their emotional and behavioral consequences). In addition, this approach is

consistent with previous research which has argued that multiple exemplars for teaching can facilitate the generalization of learning to novel tasks.

Our original manual proved to be a useful resource for teaching ToM to children with ASC, and the development of usable materials for parents and teachers focused on teaching emotions to children with ASC. In the current workbook, therefore, we have extended our section on teaching *informational* states. Given that many studies have shown difficulties with generalization beyond taught tasks and to real-life situations, examples used in this work book should be considered as a resource that could be linked to social skills training to help children link teaching to their everyday lives.

Thinking about informational states

This workbook focuses on teaching children about informational states. Developmental levels are proposed to teach ToM that includes *perception* (what people see), *knowledge* (what people know) and *belief* (what people think). The first five levels are based on our previous book. The sixth level extends our original work to include second-order ToM. The first two levels provide an introduction to the idea that people can see different things or have a different visual perspective on the same object. These two levels match those in our previous workbook and are important for linking seeing to knowing.

Level 3 builds on our previous work to provide a series of stories to help children to understand what people know and don't know and to understand the source of that knowledge. To extend our previous book, this level (along with Levels 4 to 6) uses *thought bubbles* to help children to think about mental states. The workbook is designed so that children can point to the thoughts of story characters. Alternatively, examples can be photocopied and children can color in the picture that is related to protagonists' thoughts.

Levels 4 to 6 aim to facilitate children's understanding of what people think and to recognize that people can think things that are *true or false*. Level 6 is an addition that aims to teach children to consider embedded beliefs; people can think about what other people are thinking.

Visual perspective taking

Before you work with children on understanding people's thoughts, you can encourage them to think about visual perspective taking—the

understanding that different people can see different things. Visual perspective taking is broken down into simple perspective taking:

LEVEL 1: SIMPLE PERSPECTIVE TAKING—Understanding that the child and teacher can see different things.

LEVEL 2: COMPLEX PERSPECTIVE TAKING—Understanding that the child and teacher have a different perspective on something.

Conceptual perspective taking

The next four levels build on Level 1 and Level 2. They extend children's ability to understand that people can see different things or have a different visual perspective to an understanding that people can think different things or have different thoughts about the same thing. This ability is sometimes called *conceptual perspective taking*. Conceptual perspective taking is related to an individual's understanding of thoughts and how these can be used to predict people's behavior and emotions. Here, there are four levels which aim to encourage children to think about other people's thoughts and how these link to subsequent behavior.

LEVEL 3: SEEING LEADS TO KNOWING—Understanding that people only know about things that they have experienced directly or indirectly.

LEVEL 4: TRUE BELIEF—Understanding that people can hold beliefs that are true, and that their behavior is linked to these beliefs.

LEVEL 5: FALSE BELIEF—Understanding that people can hold beliefs that are false, and that their behavior is linked to these beliefs.

LEVEL 6: EMBEDDED BELIEF—Understanding that one person can think about what another person is thinking and that they use that understanding to predict behavior.