Children's CBT skills, metacognition, empathy, and theory of mind

Article

Accepted Version

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Journal of Children's Services

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Journal:	*Journal of Children's Services*
Manuscript ID	JCS-12-2017-0052.R1
Manuscript Type:	Research Paper
Keywords:	Cognitive Behavioural Therapy, Metacognition, Empathy, Theory of Mind, Development, Children

Metacognition, Empathy, and Child CBT

Abstract

Purpose - Cognitive Behavioural Therapy (CBT) is an evidence based treatment for common mental health problems that affect children, young people, and adults. The suitability of CBT for children has been questioned because it requires children to think about their thoughts, feelings, and behaviours. The aim of this study was to investigate which cognitive and affective capacities predict children's ability to relate thoughts, feelings, and behaviours.

Design/methodology/approach - Fifty nine typically developing children aged between 8-11 years took part in the study. CBT skills were assessed on a story task that required children to relate the character's thoughts to their feelings and behaviours. Children also completed an assessment of IQ, a feeling-of-knowing metamemory task that assessed metacognition, and a higher-order Theory of Mind (ToM) task. Furthermore, parents rated their child's empathy on the Children's Empathy Quotient.

Findings – Children demonstrated high levels of CBT skills, metacognition, and ToM. CBT skills were significantly predicted by metacognition and empathy, but not ToM.

Originality/value – The findings suggest that CBT is developmentally appropriate for 8-11 year old children; however, young children and children with mental health problems may have impaired metacognition and CBT skills. Metacognition and empathy may moderate the efficacy of child CBT and warrant further investigation in clinical trials.

Keywords: Cognitive Behavioural Therapy, Metacognition, Empathy, Theory of Mind, Children

Article Type: Research Paper

Introduction

Cognitive Behavioural Therapy (CBT) seeks to address maladaptive behaviours and psychological distress by altering the cognitive processes and behaviours that sustain them. During therapeutic sessions, patients are required to participate in complex dialogue about their thoughts and feelings. To make this accessible to children, abstract concepts may be conveyed using concrete examples, stories, and visual imagery (e.g. Stallard, 2002a).

Reviews have concluded that CBT is an effective treatment for childhood and adolescent depression (Arnberg and Öst, 2014; Watanabe et al., 2007) and anxiety (James et al., 2015). However, approximately 40% of children with anxiety (James et al., 2015) and 50% of children with depression (Watanabe et al., 2007) still meet diagnostic criteria following treatment. This may partly be because some children's cognitive and affective abilities are not sufficiently developed to fully engage with the therapeutic exercises (see Grave and Blissett, 2004, for a discussion). Further, when therapies have been shown to be effective, concerns have been raised over whether this is due to behavioural components and increased parental involvement, rather than cognitive restructuring (see Stallard, 2002b, for a review).

To engage with cognitive restructuring, children must have developed the capacity to think about their thoughts, feelings and behaviours, and how they are related. Quakley (2001) designed two tasks that imitate the activities given to children receiving CBT. The 'discrimination task' requires participants to sort sentences containing a thought, feeling, or behaviour into the appropriate boxes. At the age of four, children begin to show some ability to discriminate thoughts, feelings and behaviours, given appropriate visual cues (Quakley et al., 2004), and by the age of seven children can complete this task proficiently (Quakley et al., 2003). The 'linking task' requires children to listen to a story and make associations between the protagonist's thoughts and their feelings and behaviours. Between five to seven years, children show some capacity to link thoughts to feelings, and to generate post-event attributions (Doherr et al., 2005). Similarly, whilst five year old children have a poor understanding of the relationship between thoughts and feelings, eight year olds understand that a thought can cause a sudden change in emotion and that sadness is normally associated with sad thoughts (Flavell et al., 2001). Thus, by the age of eight, children have a basic understanding of the relationship between thoughts, feelings and behaviours.

Metacognition, Empathy, and Child CBT

The ability to think about one's own thoughts and feelings may largely depend on the development of metacognition and theory of mind (Quakley et al., 2004), which are closely related to executive functioning (Fernandez-Duque et al., 2000). Metacognition is the process of thinking about one's own thinking and it begins to develop in early childhood (Flavell et al., 2000). It has been suggested that metacognition is required to engage in CBT because it encompasses self-observation and self-evaluation (Grave and Blissett, 2004). At a basic level, one must know what they are thinking, feeling or doing, in order to discriminate between different thoughts, feelings or behaviours. Furthermore, one must have the capacity to understand how their thoughts, feelings and behaviours are related; for instance, how one's negative feelings and behaviours might be maintained by their maladaptive thought patterns. In fact, metacognition itself is a target for some CBT interventions given the role it can play in the maintenance of mood disorders. For example, Wells' metacognitive focused CBT primarily aims to modify metacognitive beliefs about worry in generalised anxiety disorder, rather than the worries themselves (Wells and King, 2006), and has been adapted for children (Esbjørn et al., 2015). In addition, mindfulness-based training aims to enhance metacognitive awareness when preventing relapse of depression (Crane et al., 2010).

Metacognition broadly concerns thinking about thinking (Flavell, 1979) and is a complex construct that is not directly observable. Assessments (see Lai, 2011, for a summary) have often focussed on a particular aspect of metacognition, such as metamemory. Metamemory is the awareness of one's memory contents (i.e. monitoring) and the use of strategies to improve memory (i.e. regulation; Nelson, 1990). The feeling-of-knowing paradigm (Hart, 1965) tests participants' ability to gauge the contents of memory, and the subsequent retrievability of currently inaccessible material. Previous research (e.g. Koriat, 1993) has shown that the feeling-of-knowing relies on a complex set of problem solving and epistemic processes that allow one to accurately gauge which non-recalled items will nonetheless be recognised at a later phase in the experiment. Thus, this paradigm measures the online ability to monitor mental operations and contents. Metamemory has also been associated with individual differences in executive functions (Mäntylä et al., 2010; Souchay and Isingrini, 2004), which may further support children's ability to relate thoughts to feelings and behaviours.

A closely related cognitive system to metacognition is theory of mind (ToM). As originally defined, ToM is the ability to attribute mental states to oneself and others (Premack and

Woodruff, 1978). These pioneering researchers explain that it is termed a theory because mental states are not directly observable and because ToM can be used to predict the behaviours of others. It is perhaps for this second reason that ToM has been intensely investigated in the domain of social cognition. Thus, a large proportion of the literature has only assessed attributions of mental states to others using methods such as the 'false-belief' task (Wimmer and Perner, 1983). Understanding the mental states of others is also important for child CBT because therapeutic exercises can require children to think about the thoughts and feelings of characters in various scenarios (e.g. Stallard, 2002a). Ultimately, this is to encourage the children to think about themselves in the same way.

Two theories have sought to explain how we read the minds of others (Gallese and Goldman, 1998). 'Theory theory' is closely related to ToM. It posits that we reason the mental states of others and predict their behaviour by using a set of general laws that relate mental states to external stimuli and behaviour (Gopnik and Wellman, 1992). 'Simulation theory' is related to empathy; the capacity to share in the feelings of others (Singer, 2006). This theory postulates that we can imagine ourselves in the position of other people and predict their mental states and behaviour by employing our own cognitive systems to imagine how we would feel or behave (Gallese and Goldman, 1998; Goldman, 1989).

The Current Study

This study aims to investigate the relationship between metacognition, ToM, empathy, and children's CBT skills. By the age of eight, children are aware of their cognitions (Flavell et al., 2000) and partially aware of how their thoughts and feelings are related (Flavell et al., 2001). Children have an advanced ToM by the age of 10 (Liddle and Nettle, 2006), meaning that they can infer what someone knows about another person's beliefs (second-order ToM) and what a third person may know about that (third-order ToM). The current study will examine whether these cognitive and affective capacities are related in a sample of children aged 8-1l years old. To assess CBT skills, children will complete the thought-feeling and thought-behaviour linking task (Quakley, 2001), as well as measures of ToM, metamemory and empathy. It has been suggested that the capacity to think about thoughts, feelings and behaviours is associated with metacognition and ToM (Grave and Blissett, 2004; Quakley et al., 2004). Therefore, it is hypothesised that metamemory and ToM will predict children's

ability to link thoughts to feelings and behaviours over and above IQ, which is a measure of general cognitive ability. The findings of the study may identify important prerequisites of chid CBT, which may lead to recommendations for assessment and inform treatment decisions and delivery.

Method

Participants

Fifty-nine typically developing children took part in the study. The children were aged 8 to 11.83 years (M=9.62, SD=1.07). The sample consisted of 28 (48%) boys and 31 (52%) girls. Fifty children (85%) were White British, three were British Mixed Race and one was White European; five responses were missing. All participants spoke English as their first language. Children with a learning disability, history of head injury, pervasive developmental disorder, autistic spectrum condition, or previous contact with mental health services (see Reynolds et al., 2006) were excluded from the study.

Procedure and Materials

The testing sessions were one-to-one for approximately 90 minutes and regular breaks were offered during this time. Tasks were administered according to standard instructions (see cited studies below) and a standard test order was applied to reduce interference effects and maintain motivation.

Thought-to-Feeling and Thought-to-Behaviour Linking Task:

The linking task measured children's ability to understand another child's feelings or actions in relation to their thoughts (Quakley, 2001). The experimenter read aloud eight brief stories about different children and presented accompanying picture cards (see Figure 1). Each story centred on an event and how the protagonist felt or acted in response to this event. Later in the story, there was a cue that served as a reminder about the past event, which then caused the protagonist to feel or act in the same way as before. Participants were asked why the protagonist felt or acted the way they did. To score full marks participants had to mention the

past event, the cue, and that the protagonist was thinking about the event (e.g. remembered). If incomplete responses were given, the experimenter would ask prompting questions.

Insert Figure 1 here.

Feeling-of-Knowing Metamemory Task:

This task was chosen to operationalise individual differences in metamemory and metacognition. Feeling-of-knowing has been shown to predict subsequent recognition (Hart, 1965) and previous tasks have been shown to have high test-retest reliability (.90; Nelson and Narens, 1980). The task follows four stages: study, cued-recall, feeling-of-knowing judgment, and recognition (Wojcik et al., 2013). Participants studied 20 word pairs that were presented one at a time on a computer screen for five seconds and simultaneously read aloud by the experimenter. The word pairs contained a cue word in lower case letters and a target word in upper case letters (e.g. 'chain' – 'ADVICE'). The matrix reasoning subtest was administered immediately after the presentation of the stimuli for five minutes and served as a distracter task. Children who did not finish the matrix reasoning subtest within five minutes completed it at the end of the metamemory task.

In the next phase, participants were presented with the cue words one-by-one. They were then asked two questions: "Can you remember the word that went with 'chain'?" and, "Would you be able to recognise that word if you were given four options?". Participants attempted to recall the target word before making a feeling-of-knowing judgement that was either 'Yes' or 'No'. Only those words which participants failed to recall were included in the analysis of metamemory performance (see Hart, 1965).

In the final phase, participants were presented with the cue words in the same order again. This time, four words, all in upper case, were presented beneath the cue. These included the correct target word and three previously unseen distracter words, which were not semantically related to the target word. Participants were instructed to select which word had been previously presented with the cue word. The main task was preceded by a practice run with three word pairs.

Higher-Order ToM Task:

This task is an extension of the widely used false-belief paradigm (Wimmer and Perner, 1983) that was chosen to measure individual differences in zero- to fourth-order ToM. Previous evidence suggests that this task has construct validity as performance has been associated with teacher ratings of children's social competence (Liddle and Nettle, 2006). Participants were told five different stories involving multiple characters in each. After each story the children were asked four questions (Liddle and Nettle, 2006). Two questions related to the events that occurred in the story and simply checked children's memory. The other two questions examined children's understanding of the characters' thoughts and beliefs. In total there were 10 ToM questions, two at each order. Zero-order ToM tested factual knowledge about the character, first-order tested knowledge about the character's thoughts, second-order tested knowledge of one character's thoughts about another character's thoughts, and so on. For each question, children had to decide which of two statements was true (see Appendix 1). For example, after hearing a story about Bob and Johnny who want to play on the school football team, one of the level 2 ToM questions asked which of the following statements was true: a) Johnny doesn't know that the manager wants both him and Bob on the team, b) Johnny thinks that the manager wants both him and Bob on the team.

The Children's Empathy Quotient (EQ-C):

The EQ-C is a parent-report questionnaire that measures empathy (Auyeung et al., 2009), which was adapted from the adult self-report questionnaire (Baron-Cohen and Wheelwright, 2004). Empathy was assessed because, like ToM, it is related to understanding other people's mental states (see Baron-Cohen and Wheelwright, 2004). Parents were asked to report their level of agreement with 26 empathetic and unempathetic statements concerning their child, on a four-point scale from 'Definitely Agree' to 'Definitely Disagree'. For example, "My child gets upset at seeing others crying or in pain" and "My child is often rude or impolite without realising it". The scale has high internal consistency (α=.93) and good test-retest reliability (.86; Auyeung et al., 2009).

Wechsler Abbreviated Scale of Intelligence II (WASI-II):

The two subtests version of the WASI-II (Wechsler, 2011) was used to examine whether general cognitive ability better explains individual differences in children's CBT skills than metacognition and ToM. Children completed the vocabulary and matrix reasoning subtests, which were standardised and totalled to give the Full Scale Intelligence Quotient (FSIQ-2). The FSIQ-2 has excellent internal consistency (.93), excellent test-retest reliability (.87-.95), and very high interrater reliability (.94-.99; McCrimmon and Smith, 2013). The scale has good internal structure, good levels of concurrent validity with other measures of IQ (.71-.92), and it distinguishes children with intellectual disability from typically developing children (McCrimmon and Smith, 2013).

Ethical Considerations

The study was approved by the University of Exeter Ethics Committee (2013/339). All participants provided informed assent with parental consent. Children were rewarded with a certificate for taking part and entered into a prize draw to win one of three £10 vouchers.

Data Analysis

Analyses were performed in SPSS (IBM, SPSS version 20). Metamemory was calculated by comparing recognition accuracy to feeling-of-knowing judgements for each word-pair. Specifically, Goodman-Kruskal Gamma correlations (Goodman and Kruskal, 1954) were calculated, using the same method as Wojcik and colleagues (2013). The Gamma statistic is a coefficient with values from -1 to 1 that indicates the strength and direction of the correlation between metamemory judgements and actual memory performance. Stepwise multiple regression was used to test the hypotheses that metacognition and ToM predict children's ability to engage with CBT. One child had missing data and was removed from the analyses in a casewise manner.

Results

Sample Characteristics

Means and standard deviations for all of the measures are displayed in Table 1. Age significantly correlated with ToM, metamemory and recall on the feeling-of-knowing task, and there were no significant gender differences.

Insert Table 1 here.

Metamemory

To check children's memory for the word-pairs in the feeling-of-knowing task, a one-sample t-test was conducted. This showed that the children's performance was significantly greater than chance, $t(57)=22.53$, $p<.001$, indicating that children were remembering the word pairs. A repeated measures ANOVA revealed that children believed they would recognise significantly more words ($M=15.84$, $SD=4.84$) than they actually did ($M=13.84$, $SD=2.99$), $F(1, 57)=7.042$, $p=.01$, suggesting over-confidence. A one-sample t-test revealed that Gamma scores ($M=.19$, $SD=.41$) were significantly different from zero, $t(57)=3.57$, $p=.001$, demonstrating that children were able to accurately predict their recognition of non-recalled items. Gamma significantly correlated with the number of words recognised, $r(56)=.22$, $p=.052$, demonstrating that children with greater awareness of the contents of their memory remembered more items.

Theory of Mind

To check children's memory for the ToM stories, a one-sample t-test was conducted. This showed that children performed significantly better than chance, $t(58)=54.86$, $p<.001$, indicating that they were remembering the stories. For the ToM questions, one-sample t-tests demonstrated that children performed significantly better than chance responding, $t(58)=21.06$, $p<.001$, which was true at all levels of ToM (all $p<.001$). Twelve (20.3%) participants scored 10 out of 10, indicating a ceiling effect.

Linking Thoughts, Feelings, and Behaviours

On average, children performed highly on the task scoring 69.43 (*SD*=14.05) out of 96. To understand which variables predicted children's ability to relate thoughts, feelings, and behaviours, a linear regression was performed using the Stepwise method. Performance on the linking task was the dependent variable and age, empathy, metamemory, IQ, and, ToM were included as independent variables. The analysis revealed that empathy and metamemory significantly predicted children's ability to engage with CBT (see Table 2). This was also true when individual differences in IQ were accounted for in the model. The results imply that children with higher empathy and metamemory performed better on the linking task. ToM did not significantly correlate with performance on the linking task, $r(57)=.19$, $p=.076$, or empathy, $r(57)=.02$, $p=.906$.

Insert Table 2 here.

Discussion

The aim of this study was to investigate which cognitive and affective capacities predict children's ability to link thoughts to feelings and behaviours; a crucial CBT skill, which may moderate treatment outcomes. Metamemory significantly predicted performance on the linking task, and this remained true when controlling for IQ. This suggests that children with greater metacognitive awareness of the contents of their memory were more able to link thoughts to feelings and behaviours. One explanation is that metamemory and metacognition are associated with executive functions (Mäntylä et al., 2010; Souchay and Isingrini, 2004), which may support the ability to relate thoughts to feelings and behaviours. It is also possible that children with greater awareness of their own mental states have more experience understanding how their thoughts relate to their feelings and behaviours. This metacognitive competency may well be transferrable to the mental states of others, given a basic understanding of people as cognitive entities. However, as only one aspect of metacognition was measured in the present study, it needs to be established whether CBT skills are specifically associated with metamemory or metacognitive awareness more generally. This may be achieved using self-report measures, such as the Metacognitive Awareness Inventory

(Schraw and Dennison, 1994), parent-report measures, such as the Behaviour Rating Inventory of Executive Functions (Gioia and Isquith, 2011), or other tasks, such as post-task appraisal of difficulty (Krasny-Pacini et al., 2015).

Empathy also predicted performance on the linking task, suggesting that individuals with higher levels of empathy found it easier to understand the feelings of the protagonists in the stories. Simulation theory posits that we understand the mental states of others by projecting ourselves into their situation and employing our own cognitive mechanisms to imagine how we would feel in that situation (Gallese and Goldman, 1998; Goldman, 1989). Indeed, the empathic process of internalising another person's situation and feelings, may subsequently allow understanding of their mental state by employing metacognitive knowledge and skills on that information (Singer, 2006). This is reflected in the empathy and metamemory model, which suggests that children used metacognitive and empathic processes to relate thoughts to feelings and behaviours.

ToM did not correlate with performance on the linking task, which may be due to the ceiling effect observed on the ToM task. The task may have been too easy for 8-11 year old children, meaning that it lacked sensitivity to individual differences in ToM. It may be beneficial to introduce more trials at the higher levels of ToM for children of this age or to request children's justifications for their responses to avoid guessing (e.g. Happé, 1994). Another explanation for the absence of a correlation may be that children did not employ ToM in the linking task. Both the ToM task and the linking task share similar cognitive demands as they require participants to infer other people's mental states. However, the linking task also requires participants to understand people's thoughts in relation to their feelings or actions, and that certain cues can trigger thoughts about previous events. The tasks also differ in their emotional content and demands. The ToM task only requires participants to infer what a character knows or believes, whereas the linking task requires participants to think about a character's thoughts in relation to their feelings and behaviours (note that the behaviours in the thought-to-behaviour stories are also emotionally salient). This may suggest that children relied more on empathic processes to understand emotions and complex mental states, as required in the linking task. Empathy did not significantly correlate with ToM, which may suggest that children used general principles rather than empathy to reason the characters' beliefs or knowledge in the ToM task, in accordance with 'Theory theory' (Gopnik and

Wellman, 1992). Future research will need to confirm whether children use different cognitive and affective processes for inferring others' emotions, beliefs, and more complex mental states.

The findings of the present study suggest that metacognition and empathy may moderate children's engagement in CBT. An interesting avenue for future research will be to investigate whether these cognitive and affective capacities are associated with treatment outcomes, particularly because they may be underdeveloped in young children and impaired in children with mental health problems (Reynolds et al., 2006). If metacognition and empathy are found to moderate treatment outcomes, then assessment of these capacities could facilitate decisions regarding appropriate treatment. Poor performance on such assessments could indicate that a behaviourally oriented intervention may be more appropriate or that these skills will first need to be developed with the therapist for the child to effectively engage with CBT.

Conclusion

The present study demonstrates that typically developing children aged 8-11 years old are metacognitively aware of the contents of their memory, they can reason other people's mental states to the fourth-order, and they can relate thoughts to feelings and behaviours, which suggests that CBT is typically developmentally appropriate. Metacognition and empathy were found to significantly predict children's ability to relate thoughts, feelings, and behaviours, which may be a critical skill for children to engage with cognitive restructuring in CBT. Therefore, metacognition and empathy may be important moderators of treatment outcomes, which should be investigated in future clinical trials. Clinicians should consider children's metacognition, empathy, and related skills when making decisions about appropriate treatment.

Implications for policy and practice

- Typically developing children aged 8-11 years old are metacognitively aware, have an advanced ToM, and can relate thoughts, feelings, and behaviours, suggesting that CBT is an appropriate treatment for children this age
- However, younger children and children with mental health problems may have impairments in these skills, which could limit the effectiveness of CBT
- In these cases, clinicians may need to train children's CBT skills or consider more behaviourally oriented treatments

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Appendix 1: Example Statements of the ToM Task at Each Level

ToM Level 0:

a) Bobby's favourite thing in the world is chocolate.

b) Bobby's favourite thing in the world is going out with his friends.

ToM Level 1:

a) Bobby thinks his chocolate is in his mum's shopping bag.

b) Bobby thinks his chocolate is in his cupboard.

ToM Level 2:

a) Johnny doesn't know that the manager wants both him and Bob on the team.

b) Johnny thinks that the manager wants both him and Bob on the team.

ToM Level 3:

a) The manager thinks that Johnny knows he wants him to be on the football team.

b) The manager knows that Johnny doesn't know that he wants him to be on the team.

ToM Level 4:

a) Ben thinks that Anna believes that he knows that Mum wants perfume for her birthday.

b) Ben thinks that Anna knows that he knows that mum wants flowers for her birthday.

Figure 1.

An Example of the Thought-Behaviour Picture and Story Stimuli (adapted from Quakley et al., 2004)

1. Thought to Behaviour. Sad. Male

Put picture 1 down
Say: This is Ben

Put picture 2 down
Say: This is Ben's playground in his new school

Put picture 3 down
Say: One day Ben was playing in his new playground

Put picture 4 down
Say: When some big boys in red coats came over and called Ben names

Put picture 5 down
Say: Ben ran away to hide
Say: Why did Ben run away to hide?

Put picture 6 down
Say: Many days later, Ben was playing with his friend Clare

Put picture 7 down
Say: When Ben saw the big boys in red coats

Put Picture 8 down
Say: Ben Ran away to hide
Say: Why did Ben run away to hide right now?

Table 1.

Descriptive Statistics, Correlations with Age and Comparisons between Gender Groups

	M	*SD*	Age (*r*)	Gender (*t*)
Linking Task	69.43	14.05	.20	1.43
Empathy	40.66	6.86	.08	.52
False-Belief:				
Memory	9.68	.66	.11	.79
Theory of Mind	8.42	1.25	.25*	.81
Feeling-of-Knowing:				
Recall	1.66	1.58	.23*	.11
Recognition Memory	13.84	2.99	.14	.07
Yes Judgments	15.84	4.84	.01	1.82
Gamma	.19	.41	.34**	.77
WASI-II:				
FSIQ-2	108	12.7	N/a	1.55
Vocabulary	57.78	8.66	N/a	.60
Matrix Reasoning	51.66	9.85	N/a	1.84

Note: Scores on the WASI-II are standardised for age. *p<.05, **p<.01

Table 2.

Results of the Regression Analyses for Performance on the Linking Task

Model	R^2	F	p	Predictors	β	t	p
1	.15	4.84	.012	Empathy	.29	2.35	.022
				Metamemory	.26	2.08	.042
2	.15	3.21	.030	Empathy	.28	2.06	.044
				Metamemory	.26	2.08	.043
				IQ	.04	.33	.743