Challenging anxious cognitions or accepting them? Exploring the efficacy of the cognitive elements of cognitive behaviour therapy and acceptance and commitment therapy in the reduction of children's fear of the dark

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A nxiety is highly prevalent in pre-adolescent children. Distorted cognitions are characteristic for dysfunctional levels of anxiety. However, applying cognitive elements in pre-adolescent children cannot be fully ascertained, as it is not until adolescence before children can apply logical and abstract reasoning in a sophisticated manner. Cognitive behaviour therapy (CBT) and acceptance and commitment therapy (ACT) both target distorted cognitions. Whereas CBT encourages children to change the content of negative cognitions by applying cognitive restructuring, ACT stimulates youth to have a more accepting attitude towards these thoughts by applying cognitive defusion. The current study examined the efficacy of applying cognitive elements and compared the cognitive elements of CBT and ACT in pre-adolescent children. We included no behavioural elements to specifically study the developmental appropriateness of the cognitive elements in this age group. Highly anxious children, aged 8–12 years were randomised to a 30-minute cognitive restructuring ($n = 21$) or cognitive defusion intervention ($n = 22$). Subjective fear of the dark levels, behavioural darkness toleration, and comprehension and fun associated with the interventions were assessed. Both interventions had a significantly positive impact on children's fear of the dark. Cognitive restructuring led to more favourable results on subjective fear than cognitive defusion, no differences were found for darkness toleration.

Keywords: Child anxiety; Cognitive restructuring; Cognitive defusion; Fear of the dark; Pre-adolescence.

Anxiety is a normal and adaptive emotion, facilitating rapid responses to danger (Barlow, 2002; Marks & Nesse, 1994). However, when anxiety is disproportionate to the actual threat or becomes an enduring state, it can be regarded as dysfunctional. Together with subjective feelings of anxiety, physiological responses, and avoidance, distorted cognitions are commonly encountered in terms of dysfunctional levels of anxiety. Distorted anxious cognitions result from overactive vulnerability and danger schemas (Kendall, 1985; Muris & Field, 2008). Anxiety disorders have a median age of onset before adolescence, which is early compared to other psychiatric disorders (Kessler et al., 2005). Anxiety disorders also have a high continuity and frequently precede other disorders (see review: Simon, van der Sluis, Muris, Thompson, & Cartwright-Hatton, 2014). These arguments underscore the importance of early intervention for young persons who display dysfunctional anxiety.

Cognitive behaviour therapy (CBT) is currently considered to be the gold standard treatment for fear and anxiety problems and has been effectively applied in children (e.g., Kendall, 1994; Kendall & Hedtke, 2006;

Ollendick et al., 2009; Simon, Bögels, & Voncken, 2011). One central idea of CBT is that emotions are connected to thoughts. Within CBT for anxiety problems, distorted anxious cognitions are targeted by the cognitive element of cognitive restructuring (Beck, 1979; Beck & Beck, 2011). Cognitive restructuring is a psychotherapeutic process during which the client learns to identify irrational, maladaptive, dysfunctional thoughts, known as cognitive distortions (e.g., all-or-nothing thinking), and to transform these into more rational, adaptive and functional thoughts. With anxiety problems, the client learns to identify threat-related dysfunctional thoughts and to transform them to functional thoughts about feared stimuli and situations.

In recent years, acceptance and commitment therapy (ACT) has been put forward as an alternative cognitive-behavioural intervention for treating anxiety problems (Arch & Craske, 2008; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009). The key element of ACT is to accept what is out of personal control and to commit to valued behaviour. While the behavioural components of CBT and ACT are comparable, ACT provides an alternative approach to deal with anxious cognitions. Instead of applying cognitive restructuring, ACT relies on a technique named cognitive defusion, which teaches clients to separate and distance themselves from the literal content and meaning of their thoughts.

Thus, CBT and ACT share commonalities but also differ from each other (Arch & Craske, 2008). Both types of cognitive therapies stimulate clients to approach their anxious thoughts from a more objective point of view. However, whereas CBT prompts individuals to *change the content of cognitions*, ACT adopts a Buddhist perspective by stimulating clients *to have a more accepting attitude towards their thoughts* (Arch & Craske, 2008; Hayes et al., 2006). In the current study, we adopted an experimental approach to compare the effects of the cognitive techniques of CBT and ACT.

Although intervening via cognitions may be an interesting path to follow, it is of strong importance to keep in mind that adults and children differ considerably in their developmental level (Newman-Kingery, Roblek, Grover, & Sherrill, 2006) and that young people have unique developmental needs that should be addressed in intervention and treatment protocols (Barrett, 2000; Piacentini & Bergman, 2001). This is true for CBT as well as for ACT-based treatments. To our knowledge, so far, no study has compared the efficacy of the cognitive components of CBT and ACT in children. Therefore, it is of interest to study to what degree children in middle childhood specifically benefit from ACT's and CBT's cognitive elements. This study uniquely compared the cognitive elements of CBT and ACT in pre-adolescent anxious children.

We focused our cognitive interventions on fear of the dark. Although part of the normal development (Muris, Merkelbach, Ollendick, King, & Bogie, 2001), approximately 20% of children are hindered by serious nighttime fears and problems sleeping (Gordon, King, Gullone, Muris, & Ollendick, 2007), with equal prevalence rates for boys and girls (Meltzer et al., 2009). In children aged 8–12 years who were diagnosed with a specific phobia ($n = 95$), phobia of the dark was the most prevalent (27%) type (Simon & Bögels, 2009). These children typically experience severe fear and anxiety symptoms before they go to bed as well as during the rest of the night (Lewis, Amatya, Coffman, & Ollendick, 2015). Fear of the dark has also been shown to be associated with an increased risk for future anxiety problems and depression (Essau, Conradt, & Petermann, 2000; Pine, Cohen, & Brook, 2001).

In general, it has been shown that specific phobias can be successfully treated with CBT (Chorpita et al., 2011; Kendall, 2012), and there are also indications that nighttime fears are susceptible to such interventions (Lewis et al., 2015). So far, no study has evaluated the effects produced by the cognitive components of CBT and ACT. With this in mind, the present study compared the effects of the cognitive restructuring component of CBT and the cognitive defusion component of ACT for reducing fear of dark in 8–12-year-old children. It was expected that both would be potent interventions to reduce this type of childhood fear. Potential differences in the effects of CBT's cognitive restructuring and ACT's cognitive defusion were explored. The level of comprehension and the level of fun associated with both cognitive interventions were also investigated in order to obtain some insight in the developmental appropriateness of these cognitive techniques in children of this age.

METHOD

Participants

We aimed at selecting 8–12-year-old children who were afraid of the dark. An a priori power analysis G*Power 3 (Faul, Erdfelder, Buchner, & Lang, 2009) showed that a sample of 42 participants was required (ρ H1 = 0.18, α = 0.05, Power = 0.90).

Children were recruited via regular primary schools in Belgium. Of the 16 schools that were approached, 14 (88%) primary schools consented to participate. Of the 672 approached children at these schools, 235 (35%) children had a parental informed consent to complete the Fear of the Dark Questionnaire (see below) and the Fear of the Dark Thermometer (see below).

From this group (Fear of the Dark Questionnaire: $M = 27.95$, $SD = 9.53$; Fear of the Dark Thermometer:

$M = 4.59$, $SD = 3.06$), we selected children ($n = 60$) who had total scores that fell in the top 25% on the sum score of the Fear of the Dark Questionnaire ($M = 40.23$, $SD = 3.88$) and the Fear of the Dark Thermometer ($M = 8.28$, $SD = 1.52$; sum score: $M = 48.53$, $SD = 4.23$). Boys ($M = 48.14$, $SD = 4.53$) and girls ($M = 48.76$, $SD = 4.09$) had comparable scores on the sum score, $t(58) = .55$, $p = .584$. The parents received an information letter and a consent form on which they were asked to indicate whether their children were allowed to participate in the experiment. Eventually, parental consent via a signed form had been obtained for 43 children to take part in the study, with 21 children being randomised to the cognitive restructuring group (CBT) and 22 children being randomised to the cognitive defusion group (ACT). The children who were randomised to the cognitive restructuring group ($M = 48.33$, $SD = 4.29$) and those who were randomised to the cognitive defusion group ($M = 49.05$, $SD = 4.48$) had comparable scores on the sum score, $t(41) = -.53$, $p = .598$.

The entire group constituted of 16 boys (37%) and 27 girls (63%). The participation rate did not differ significantly between boys and girls, $\chi^2(1) = 2.82$, $p = .093$. Boys and girls did not differ with regard to age (boys: $M = 9.50$, $SD = .97$; girls: $M = 9.15$, $SD = 1.20$), $t(41) = 1.00$, $p = .325$. The mean number of children in the families of participating children was 2.86 ($SD = 1.34$), with most children ($n = 17$, 40%) coming from families with two children. Most children had a mother and a father ($n = 28$, 65%), 12 children (28%) had parents who were divorced and had found a new partner, and 3 children (7%) had other family compositions. Most children were of Belgian nationality ($n = 40$, 93%). Regarding parental educational level, most parents had a bachelor degree ($n = 17$, 40%) or had completed secondary school ($n = 16$, 37%). Of the parents who shared information on their families' gross income ($n = 36$, 84%), the monthly gross income ranged from €1250–€1500 ($n = 2$, 6%) to more than €4750 ($n = 6$, 17%), with most families ($n = 8$, 22%) reporting a monthly gross income ranging between €3250 and €3750. Children who were randomised to the cognitive restructuring or cognitive defusion group did not differ on any of these demographic features, all p's $> .10$.

Procedure

The study was approved by the local ethical committee. Children were recruited via regular primary schools. The primary schools were contacted and informed about the research by e-mail. If schools did not respond to the e-mail invitation, they were approached by telephone. Of the 16 approached schools, 14 schools formally agreed to participate. The teachers gave the parental informed consent letters to the children and after a week the signed consent forms were recollected at the schools. Only children whose parents specifically consented for their child to participate completed the questionnaire. Children completed the Fear of the Dark Questionnaire (see below) and indicated their current fear of the dark on a Fear of the Dark Thermometer (see below) during regular classes while being supervised by their teachers. Children who scored in the top 25% were labelled as being highly anxious of the dark and were selected for further participation.

The parents of children who were highly anxious of the dark received another informed consent form for participation in the intervention part of the study. If parents consented, children were randomised to either the cognitive restructuring or the cognitive defusion intervention via the online tool Sealed Envelope Ltd.

Children were brought to the intervention by their parents. Upon arrival, children met the two experimenters who explained to them that they would be taking part in an intervention developed to help children cope with feelings of anxiety. Depending on the randomization, children either took part in a 30-minute intervention of cognitive restructuring or a 30-minute intervention of cognitive defusion. While the intervention with their children took place, parents completed a demographic features questionnaire. Before and after the intervention, children were asked to indicate their level of fear of the dark in that moment using the Fear of the Dark Thermometer (see below). These assessments took place in a normally lit room. After the intervention, the children also underwent a behavioural assessment: children were led to a lit cubicle where they were asked to turn off the light as long as possible. Children were also instructed that they were allowed to turn the light back off in case they had switched it on. Children were then left alone in the cubicle for 3 minutes. The door of the cubicle was not locked, and children were never forced to remain in the cubicle or to turn the light off. The experimenter sat in the corridor outside the cubicle and monitored the time the child had the lights off. After 3 minutes, the second experimenter briefly interviewed the child on his or her level of comprehension of the intervention and children were asked to indicate how much they liked the intervention (fun). Afterwards, children were reunited with their parents. Experimenters received instructions on what to do when the child was upset. If the child would get upset, the experimenter would reunite the child with the parent and read an age-appropriate story. In case, the child would be extremely upset, the experimenter would follow the same procedure but also advise the parents that it might be good to seek professional help to check whether the child was suffering from an anxiety disorder. However, no such incidents happened with any of the children.

The experimenters were bachelors in psychology and followed strict and detailed experimenter instructions.

Both experimenters led the CBT as well as the ACT interventions and switched roles after each experiment.

Measures

Fear of the dark. Fear of the dark was measured with the 10-item "Fear of the Dark Questionnaire" that was construed for the purpose of this study by two experts in child anxiety. This questionnaire was used to select the highly anxious children. The items measured the amount of anxiety the child was expected to feel in darkness-related situations (e.g., "Do you think something bad will happen if you're in the dark") on a 0–5 scale (0: "No, not at all; 5: "Yes, certainly"). The internal consistency of this questionnaire was good, with Cronbach's alpha = .85. Fear of the dark was significantly negatively correlated to darkness tolerance (see below), $r = .43$, $p = .004$.

The second fear of the dark measure, the Fear of the Dark Thermometer, depicted a thermometer on which children could indicate their current level of fear of the dark on a Visual Analogue Scale ranging from 0 to 10 (0: no fear at all; 10: extreme fear). This instrument was used during the selection and as outcome measure before and after the intervention.

Darkness toleration. The child's willingness to stay in the dark was clearly defined as the time between the moment the child switched off the light in the dark cubicle till the time the child turned the light back on. The maximum time the light was off was 3 minutes, as the exposure ended after 3 minutes. If children turned the light off, but turned it back on within the time frame of 3 minutes, the light-off intervals were added. A sensor was present in the cubicle that was connected to an analogue light outside the cubicle so that the experimenter was able to register the time.

Level of comprehension of the intervention. The children were interviewed on their level of comprehension of the intervention. Both the cognitive restructuring and the cognitive defusion intervention consisted of six components. Children were asked to tell the experimenter for each component which activity was undertaken and why this activity was undertaken. Children received one point for each correct answer (i.e., the right activity was mentioned and followed by a correct explanation) regarding the content and the reasoning behind the activity (minimum score: 0; maximum score: 12). Children were only prompted to respond to the question, but they were not given any predetermined answer categories. The interviews were audiotaped and were also scored by the second experimenter. The inter-rater reliability was satisfactory, $\kappa = .73$.

Level of fun in relation to the intervention. After the comprehension interview, children indicated on an 11-point Likert scale how much they liked the intervention (0: I did not like it at all to 10: I liked it very much).

Interventions

Cognitive restructuring intervention. The 30-minute cognitive restructuring intervention was based on the cognitive components of an anxiety prevention protocol used in a large anxiety prevention study for children aged 8–12 years (described in Simon et al., 2011). It consisted of the following elements in consecutive order: a short explanation of the rationale of cognitive therapy (5 minutes), choosing and formulating the dysfunctional thought about the dark (5 minutes), collecting evidence in favour of the negative thought (5 minutes), collecting evidence against the dysfunctional thought (7 minutes), formulating a helping thought (5 minutes) and a relaxation exercise (3 minutes).

Cognitive defusion intervention. The 30-minute cognitive defusion intervention was based on several existing and freely available cognitive ACT exercises and the exercises were somewhat adjusted to suit the child's cognitive level. It consisted of the following elements in consecutive order: choosing and formulating the dysfunctional thought about the dark (5 minutes), focusing on the present moment (3 minutes), the jigsaw piece metaphor (5 minutes), the "you are not your thoughts" exercise (10 minutes), caveman and internal alarm (5 minutes), singing the dysfunctional thought on the tune of "Happy Birthday" (2 minutes).

Statistical analyses

The data were entered and analysed in the IBM Statistical Package for the Social Sciences (SPSS), version 22. There were no missing items.

We assessed the intervention effect on the child's fear of the dark with a 3 (time: selection, pre-test and post-test) x 2 (intervention: cognitive restructuring and cognitive defusion) repeated measures analysis of variance (ANOVA). We included the selection scores as one of the time points in the repeated measures, instead of entering the selection scores as a covariate, because there was no significant bivariate relation between the selection score and the predictor intervention type, $r = -.11$, $p = .504$. Partial eta-squared (η_p^2) was used to gain insight in the effect sizes, which can be qualified as small (i.e., <.06), medium (i.e., .06–.14), or large (i.e., >.14; Cohen, 1973). In addition, we studied the pre–post-test effect of each intervention type on children's fear of the dark by performing paired samples t-tests within the cognitive restructuring and cognitive defusion groups. The groups were compared on pre–post-test effects by creating intervention fear of the dark gain scores (pre-test–post-test) and comparing the cognitive restructuring and cognitive defusion interventions on gain scores by the use of an independent samples t-test. Darkness toleration, level of comprehension, and level of fun of both interventions were compared between the cognitive restructuring

and cognitive defusion groups with independent samples *t*-tests. Cohen's *d* was calculated to gain insight in the effect sizes, with cut-offs being *d* = .2 for small, *d* = .5 for medium, and *d* = .8 for large effects (Cohen, 1988). A significance level of 0.05 was applied for all analyses.

RESULTS

Descriptive statistics

The descriptive statistics of the children's fear of the dark, darkness tolerance, and the level of comprehension and fun associated with both interventions are depicted in Table 1. At pre-test, there were no significant differences between children who were randomised to the cognitive restructuring intervention (*M* = 6.71, *SD* = 2.51) and those who were allocated to the cognitive defusion intervention (*M* = 6.95, *SD* = 2.26) on the Fear of the Dark Thermometer, *t*(41) = −.33, *p* = .74. In addition, there were no differences between boys (*M* = 6.50, *SD* = 2.31) and girls (*M* = 7.04, *SD* = 2.41), *t*(41) = −.72, *p* = .48 on the Fear of the Dark Thermometer. Age was not significantly correlated to the score on the Fear of the Dark Thermometer or to the score on the Fear of the Dark Questionnaire or to darkness toleration, all *p*'s > .10. There was no effect of the experimenter on the children's darkness tolerance, the level of comprehension and fun of the intervention and the post-test score on the Fear of the Dark Thermometer, all *p*'s > .10.

Fear of the dark

The development of fear across the three time points was assessed with a repeated measure ANOVA. Mauchly's test indicated that the assumption of sphericity was not violated. Fear of the dark decreased significantly over time (selection: $M_{CR} = 8.52$, $SD_{CR} = 1.29$, $M_{CD} = 8.23$, $SD_{CD} = 1.57$; pre-test: $M_{CR} = 6.71$, $SD_{CR} = 2.51$, $M_{CD} = 6.95$, $SD_{CD} = 2.26$; post-test: $M_{CR} = 3.24$, $SD_{CR} = 2.59$, $M_{CD} = 4.95$, $SD_{CD} = 2.68$), with a large effect size $F(2, 82) = 57.64$, $p = .000$, $\eta_p^2 = .58$. There was no main effect of the intervention type and the effect size was small, $F(1, 41) = 1.28$, $p = .264$, $\eta_p^2 = .03$. Fear of the dark decreased more significantly from pre- to post-test in the cognitive restructuring condition than in the cognitive defusion condition, and this difference had a medium effect size, $F(2, 82) = 3.33$, $p = .041$, $\eta_p^2 = .08$.

Darkness tolerance

Children of the cognitive defusion intervention and children of the cognitive restructuring intervention group tolerated the dark for a comparable duration, *t*(41) = .36, *p* = .717, Cohen's *d* = .12.

TABLE 1
Descriptive statistics (*M, SD*) of children (*n* = 43) scoring high on fear of the dark

	Cognitive restructuring (n = 21)	Cognitive defusion (n = 22)
Fear of the dark[a]	Selection: 8.52 (1.29)	Selection: 8.23 (1.57)
	Pre-test: 6.71 (2.51)	Pre-test: 6.95 (2.26)
	Post-test: 3.24 (2.59)	Post-test: 4.95 (2.68)
	Intervention gain: 3.48 (2.94)	Intervention gain: 2.00 (2.39)
Darkness tolerance	2.32 (.92)	2.21 (.94)
Level of comprehension of the intervention	4.35 (2.70)	2.48 (2.32)
Level of fun of the intervention	8.76 (1.41)	9.41 (.80)

[a]Measured with the fear of the dark thermometer.

Level of comprehension and level of fun associated with interventions

Children had a significantly higher level of comprehension of the cognitive elements in the cognitive restructuring intervention than of the cognitive elements in the cognitive defusion intervention, *t*(39) = 2.39, *p* = .022, with a medium to large effect size, Cohen's *d* = .74. Although children reported somewhat more fun in the cognitive defusion intervention, and a medium effect size of Cohen's *d* = .57 was obtained, this difference was not significant, *t*(41) = −1.86, *p* = .07.

DISCUSSION

Highly anxious children have dysfunctional anxious cognitions. CBT and ACT both have a cognitive component that aims to target the dysfunctional anxious cognitions: cognitive restructuring and cognitive defusion, respectively. The current study aimed to examine the efficacy and the developmental appropriateness of the cognitive elements of CBT and ACT in children aged 8–12 years who were afraid of the dark.

As expected, children's fear of the dark decreased after they received either cognitive restructuring or cognitive defusion. A large effect size was obtained, even though we selected children from a normal population and we offered them only a single 30-minute session. Anxious 8–12-year-old children can, thus, benefit from offering them only the cognitive elements of CBT and ACT, even when no behavioural exercises (such as exposure) are offered.

With respect to differences in the development of child anxiety between the cognitive restructuring group and the cognitive defusion group, self-reported fear of the

dark decreased more significantly from pre- to post-test (medium effect size) in the cognitive restructuring group than in the cognitive defusion group. However, the willingness to stay in the dark was comparable between groups. This finding might be explained by the fact that the goal of both CBT and ACT is to reduce avoidance behaviour by creating distance between the thinker and the thought (Arch & Craske, 2008), which could be a general essential element in a therapeutic process. Notably, of the 3 minutes that children were in the cubicle, children of both groups kept the lights switched off for approximately two and a half minutes, which could refer to an overall positive effect of both cognitive interventions on children's behaviour towards their feared situation.

When looking at differences between the groups with regard to the developmental appropriateness, it appeared that both cognitive interventions were perceived as equal in terms of fun. Behavioural exercises, thus, are not a necessary prerequisite for children to perceive an intervention as fun. The level of comprehension was significantly higher in the cognitive restructuring group than in the cognitive defusion group. However, in contrast to the high fun indications, the level of understanding was quite modest for children in both groups. The higher comprehension level of cognitive restructuring is most likely related to the fact that the goal of exercises is more explicitly communicated during cognitive restructuring than during cognitive defusion exercises. For example, in CBT-based treatment and interventions it is common use to explicitly state the rationale, whereas ACT's rationale remains relatively implicit in the short run and is deduced from metaphors and experiences gained later on during the course of treatment.

In sum, the cognitive restructuring component of CBT resulted in a stronger decrease of children's fear and was somewhat better understood than the cognitive defusion component of ACT. Although it seems premature to draw firm conclusions, the findings suggest that cognitive restructuring may lead to more favourable results than cognitive defusion for children in this age group. A possible explanation for this finding might be that CBT is more suitable as a short intervention than ACT. More studies, preferably with more sessions, are needed to strengthen these findings.

Limitations

Although this study uniquely examines the cognitive aspects of CBT and ACT, several limitations hinder the strength of the conclusions. Future studies should bear in mind the limitations of the study. This study's findings need to be complemented with other research on cognitive aspects of CBT and ACT in pre-adolescent children.

First, due to practical limitations, we were not able to compare several groups to each other. That is, it would

be interesting to include several groups and compare these groups to each other. This would result in the need to include eight groups: a group that was offered both cognitive and behavioural elements, a group that was only offered behavioural elements, a group that was offered only cognitive elements and a group that was offered no elements for both ACT and CBT conditions. Instead, we focused on comparing two groups: only cognitive CBT elements and only cognitive ACT elements. Nevertheless, this is the first study to specifically offer only cognitive elements to children, and to examine the efficacy of this approach. The results of this study could give impetus to future studies to examine the usefulness and efficacy of cognitive elements in children (of several age groups) in more detail.

Second, darkness toleration was only measured after the intervention. We decided to do so, because the darkness toleration could also function as an exposure task, which constitutes a behavioural element. However, having a behavioural measure pre-intervention is important to better determine the true level of improvement, as we are not aware of the children's baseline ability to stay in a dark room.

Third, this experiment only included a pre-test and a post-test to examine the effect of the intervention. It could be possible that children were hindered by anticipation fear prior to the experiment and felt relieved after the experiment, which may have clouded the effects of the intervention. It would be of value to include a follow-up test.

Fourth, we included a typical CBT outcome measure (reduction of symptomatology), but did not include a typical ACT outcome measure (psychological flexibility). However, the inclusion of a carefully quantified behavioural measure, improved comparability of the two intervention types. Also, the reduction of symptomatology was only based on children's self-report, and the inclusion of a parent report to measure children's anxiety levels would have provided a more complete picture.

Fifth, a comparison of the *net* effects of the cognitive elements of the cognitive restructuring intervention versus the cognitive defusion intervention could not be made, since we included a 3-minute relaxation exercise in the cognitive restructuring intervention. We did so to increase the comparability with the cognitive defusion intervention, which always starts off with a focus on the present moment.

Finally, although the participation rate did not differ significantly between boys and girls, remarkably more girls participated than did boys. This was, most likely, due to the fact that we applied the same cut-off for boys and girls, and girls can exhibit higher levels of fear of the dark than boys (Gordon et al., 2007). Fortunately, at pre-test, boys and girls did not differ on fear of the dark, nor did they differ in age.

Clinical implications

Offering anxious 8–12-year-old children only cognitive elements in a playful, developmentally appropriate level can have a positive effect on their anxiety level. This does not mean that cognitive elements can replace behavioural elements. It can take away some of the doubt clinicians may experience about offering cognitive approaches to pre-adolescent children, who have not fully developed abstract reasoning skills yet. Furthermore, when the pre-adolescent children are offered a short intervention to combat their anxiety, offering them the cognitive restructuring component of CBT seems to be more appropriate than offering them the cognitive defusion component of ACT. Finally, this study was undertaken in high-fearful children selected from a normal school population, and hence, one should be cautious with generalising the findings to clinically referred children.

CONCLUSION

This study is the first to shed light on offering pre-adolescent children cognitive restructuring or cognitive defusion to improve their level of fear of the dark. Both short interventions led to a significant improvement in terms of combating children's fear of the dark. The cognitive restructuring component of CBT showed more favourable results with regard to subjective anxiety levels and comprehension than the cognitive defusion component of ACT, whereas no differences between these two groups were found on the time children spent in a dark cubicle and the level of indicated fun.

REFERENCES

Arch, J. J., & Craske, M. G. (2008). Acceptance and commitment therapy and cognitive behavioral therapy for anxiety disorders: Different treatments, similar mechanisms? *Clinical Psychology: Science and Practice*, *15*, 263–279.

Barlow, D. H. (2002). *Anxiety and its disorders* (Vol. *2*). New York, NY: Guilford Press.

Barrett, P. M. (2000). Treatment of childhood anxiety: Developmental aspects. *Clinical Psychology Review*, *20*, 479–494.

Beck, A. T. (1979). *Cognitive therapy for depression*. New York, NY: Guilford Press.

Beck, J. S., & Beck, A. T. (2011). *Cognitive behavior therapy: Basics and beyond*. New York, NY: Guilford Press.

Chorpita, B. F., Daleidan, E. L., Ebesutani, C., Young, J., Becker, K. D., Nakamura, B. J., … Starace, N. (2011). Evidence-based treatments for children and adolescents: An updated review of indicators of efficacy and effectiveness. *Clinical Psychology: Science and Practice*, *18*, 154–172.

Cohen, J. (1973). Eta-squared and partial eta-squared in fixed factor ANOVA designs. *Educational and Psychological Measurement*, *33*, 107–112.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Essau, C. A., Conradt, J., & Petermann, F. (2000). Frequency, comorbidity, and psychosocial impairment of anxiety disorders in German adolescents. *Journal of Anxiety Disorders*, *14*, 263–279.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*, 1149-1160. https://doi.org/10.3758/BRM.41.4.1149

Gordon, J., King, N. J., Gullone, E., Muris, P., & Ollendick, T. H. (2007). Nighttime fears of children and adolescents: Frequency, content, severity, harm expectations, disclosure, and coping behaviours. *Behaviour Research and Therapy*, *45*, 2464–2472.

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behavior Research and Therapy*, *44*, 1–25.

Kendall, P. C. (1985). Toward a cognitive-behavioral model of child psychopathology and a critique of related interventions. *Journal of Abnormal Child Psychology*, *13*, 595–599.

Kendall, P. C. (1994). Treating anxiety disorders in children: Results of a randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *62*, 100–110.

Kendall, P. C. (2012). Guiding theory for therapy with children and adolscents. In P. C. Kendall (Ed.), *Child and adolescent therapy: Cognitive-behavioral procedures* (Vol. *4*, pp. 3–24). New York, NY: Guilford Press.

Kendall, P. C., & Hedtke, K. (2006). *Cognitive-behavioral therapy for anxious children: Therapist manual* (Vol. *3*). Ardmore, PA: Workbook Publishing.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 593–602.

Lewis, K. M., Amatya, K., Coffman, M. F., & Ollendick, T. H. (2015). Treating nighttime fears in young children with bibliotherapy: Evaluating anxiety symptoms and monitoring behavior change. *Journal of Anxiety Disorders*, *30*, 103–112.

Marks, I. M., & Nesse, R. M. (1994). Fear and fitness: An evolutionary analysis of anxiety disorders. *Ethology and Sociobiology*, *15*, 247–261.

Meltzer, H., Vostanis, P., Dogra, N., Doos, L., Ford, T., & Goodman, R. (2009). Children' specific fears. *Child: Care, Health and Development*, *35*, 781–789.

Muris, P., & Field, A. P. (2008). Distorted cognition and pathological anxiety in children and adolescents. *Cognition and Emotion*, *22*, 395–421.

Muris, P., Merkelbach, H., Ollendick, T. H., King, N. J., & Bogie, N. (2001). Children's nighttime fears: Parent–child ratings of frequency, content, origins, coping behaviors and severity. *Behaviour Research and Therapy*, *39*, 13–28.

Newman-Kingery, J., Roblek, T. L., Grover, R. L., & Sherrill, J. T. (2006). They're not just "little adults": Developmental

considerations for implementing cognitive-behavioral therapy with anxious youth. *Journal of Cognitive Psychotherapy: An International Quarterly*, 20, 263–273.

Ollendick, T. H., Öst, L.-G., Reuterskiöld, L., Costa, N., Cederlund, R., Sirbu, C., . . . Jarrett, M. A. (2009). One-session treatment of specific phobias in youth: A randomized clinical trial in the United States and Sweden. *Journal of Consulting and Clinical Psychology, 77*, 504–516.

Piacentini, J., & Bergman, R. L. (2001). Developmental issues in cognitive therapy for childhood anxiety disorders. *Journal of Cognitive Psychotherapy: An International Quarterly*, 40, 165–182.

Pine, D. S., Cohen, P., & Brook, J. (2001). Adolescent fears as predictors of depression. *Biological Psychiatry*, 50, 721–724.

Powers, M. B., Zum Vörde Sive Vörding, M. B., & Emmelkamp, P. M. G. (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and Psychosomatics*, 78, 73–80.

Simon, E., & Bögels, S. M. (2009). Screening for anxiety disorders in children. *European Journal of Child and Adolescent Psychiatry*, 18, 625–634.

Simon, E., Bögels, S. M., & Voncken, J. M. (2011). Efficacy of child-focused and parent-focused interventions in a child anxiety prevention study. *Journal of Clinical Child & Adolescent Psychology*, 40, 204–219.

Simon, E., van der Sluis, C., Muris, P., Thompson, E., & Cartwright-Hatton, S. (2014). Anxiety in preadolescent children: What happens if we don't treat it, and what happens if we do? *Psychopathology Review*, 1, 28–50.