

The Homunculi approach. A flexible cognitive behavioural therapy programme for young people on the autism spectrum or with emotional and behavioural difficulties.

Karen O'Farrell

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Social, emotional and mental health (SEMH) difficulties are increasing within the school population with recent data suggesting that one in ten young people in the UK have a diagnosable mental health disorder (DoHSC and DfE, 2017). It is therefore important to consider how young people can be supported with evidence-based interventions which can be effectively delivered in schools. The Homunculi has been developed over a ten year period by Greig and MacKay (2013). It was originally designed for young people with autism but is now presented as an approach suitable for eight year olds through to later teenagers who have, and do not have, a diagnosis of autism, for support with SEMH difficulties such as anger, anxiety and depression.

The Homunculi is described by its authors as taking both a cognitive behavioural therapy (CBT) and metacognitive approach in helping young people to “stand back from their own thinking and find new perspectives that take account of the thinking and behaviour of other people” (Greig & MacKay, 2013. p.20). Presented as a 10 week therapeutic programme, The Homunculi can be delivered to individuals or groups. It involves the creation of characters ('Homunculi' comes from the Latin for 'little people') who live inside a large skull and take on different roles to help the young people deal with the social, emotional and behavioural difficulties they are experiencing at school which may relate to friendships, dealing appropriately with emotions or communication. Once created, the characters are employed to work through different problems visually and in a story format. The young people are supported to recognise their thoughts and emotions at different stages in their story which enables the effect that their thinking has on their feelings and behaviour to be made explicit.

With no peer reviewed empirical research which evidences The Homunculi directly as an effective intervention, the psychological theory which underpins the approach will firstly be considered in order to understand and assess its potential effectiveness.

Cognitive Behaviour Therapy

CBT is widely used as a clinically-based approach for the adult population to address SEMH difficulties and is identified as the treatment of choice for anxiety in the National Institute for Health and Clinical Excellence guidelines (NICE, 2013a). It takes both a cognitive and behavioural approach and can be described as a form of psychotherapy within which problems are identified and responded to by working to effect change in thinking, emotions and behaviour (Beck, 1976). CBT seeks to identify and challenge 'thinking errors' and the feelings associated with them in order to influence the resultant behaviour. For example, a feeling of anxiety in a given situation may lead to a thought which relates to believing everyone is looking at you. This may then lead to leaving the situation and future avoidance of similar situations. CBT would aim to challenge the thoughts by increasing understanding of anxiety (psychoeducation) and testing out fears (exposure). The aim is for CBT to lead to reduced levels of anxiety and avoidance.

Evidence suggests that CBT is effective in the relief of SEMH difficulties such as anxiety and depression (Compton et al., 2004) and is increasingly being adapted for use with young people. With a growing awareness that schools must be able to effectively respond to the SEMH needs of young people (DoHSC & DfE, 2017) an expanding literature is seeking to assess the effectiveness of CBT interventions when implemented with young people in schools (e.g. Clarke, Hill & Charman, 2016; Luxford, Hadwin & Kovshoff, 2017). A meta-analysis of school-based CBT interventions (Mychailyszyn, Brodman, Read & Kendall, 2012) implemented with young people with anxiety or depression, found a moderate effect size for the reduction of anxiety ($g = 0.501$) and a small effect size for the reduction of depression ($g = 0.298$) when compared to anxiety and depression intervention control conditions. However, results also found that reductions in symptoms of anxiety and depression were not maintained in the longer term, with data showing no significant difference in the reduction of symptoms at a 12 month follow-up between the anxiety or depression and control interventions. This suggests a need to consider the ongoing support available to young people and as Mychailyszyn et al., (2012) acknowledge, future research should also seek to consider how 'success' is actually measured. It would be interesting to investigate whether interventions are leading to significant change for young people by, for example, causing them to participate in less avoidant-type behaviour since this may influence the data gathered at follow-up.

Literature which addresses the effectiveness of CBT approaches developed for young people with autism spectrum disorder (ASD) was also considered as part of this critique. Young people with ASD may be more likely to experience symptoms of anxiety in response to difficulties with social communication and in recognising and regulating their emotions (Scarpa & Reyes, 2011; Wood & Gadow, 2010). A systematic review and meta-analysis of CBT for anxiety in young people with high functioning autism concluded that CBT could be considered an effective approach to bring about a reduction in levels of anxiety (Ung, Selles, Small & Storch, 2015). A small to medium effect size ($g = -0.47$) was found after the removal of a study outlier (before removal the larger effect size was $g = -0.71$). Results indicated no significant difference in effect sizes in relation to whether reported anxiety measures were completed by the young

people ($g = -0.60$), parents ($g = -0.82$) or clinicians ($g = -1.23$) or whether the CBT sessions were delivered individually or in a group. The latter finding may be an important consideration when thinking about the time and cost implications for both schools and EP services with indications that group CBT can be as effective as individual CBT sessions.

These findings build on those from a previous review which considered eight randomised controlled trials (RCTs) of CBT for anxiety in young people with ASD (Sukhodolosky, Bloch, Panza & Reichow, 2013). Large effect sizes ($d = 1.19$ and $d = 1.21$) for clinician and parent-rated measures of anxiety respectively were reported and a moderate effect size ($d = 0.68$) was found for self-reported anxiety. Results should, however, be interpreted with caution since the identification of participants was not consistent between studies in relation to their diagnosis of ASD and whether the young people met the criteria for clinically significant levels of anxiety.

Two more recent RCTs (Clarke et al., 2016; Luxford et al., 2017) have also looked at school-based CBT programmes which target anxiety in young people with ASD and have found promising results. The 'Exploring Feelings' (Attwood, 2004) programme was used in both studies. Consistent with previous findings (Sukhodolosky et al., 2013; Ung et al., 2015) parent and child reports showed a reduction in levels of anxiety at post-intervention which were maintained at a 6 week follow up (although Clarke et al., found a slight increase in levels of anxiety from post-treatment to follow-up). Interestingly, statistical results and qualitative data in the study by Clarke et al., also indicated an increase in the young people's use of problem-solving strategies which was maintained at follow-up. Some limitations to both studies include the small number of participants, the fact that most participants were male and potential rater bias (the young people and parents in both studies knew which group they were assigned to). Neither study used an active control group and it is therefore more difficult to say that the CBT model itself was responsible for the observed change.

Whilst research has therefore demonstrated an effective use of school-based CBT for young people, what remains less clear is the persistence of the positive gains in the longer term. Maintenance of change has been identified at a six week follow-up (Clarke et al., 2016; Luxford et al., 2017) but results from a 12 month follow-up has shown no gain (Mychailyszyn et al., 2012). Further research is needed here which should also consider the type of change resulting from CBT to ensure that longer-term changes in, for example, avoidant behaviour are captured, as well as considering ongoing support for young people to help maintain the positive gains made.

Many of the studies discussed so far have a focus on reduction in levels of anxiety in particular yet there is also a need to reflect on the wider difficulties for young people with ASD. Weiss et al., (2018) considered the effectiveness of a transdiagnostic CBT intervention for young people with ASD called the Secret Agent Society: Operation Regulation (Beaumont & Sofronoff, 2008). Results for the treatment group indicated significant improvements on measures of emotional regulation and adaptive behaviours when compared to the waitlist control which were maintained at a 10-week follow-up. Further research is required in this area to establish the efficacy of this approach.

Metacognition

Metacognition (defined by Flavell (1979) as learners' knowledge about their own thinking) is also presented by the authors as instrumental in the development of *The Homunculi*. Here, it is described as supporting young people in "reflecting on their own thinking as a means of understanding and modifying their feelings and behaviour" (Greig & McKay, 2013, p. 21). Germer (2005) identifies influencing metacognitions through the modification of thinking errors as the ultimate goal of CBT. However, literature defining the links between changes in metacognition and CBT approaches are sparse. Wells (2005) presented a Metacognitive model of generalised anxiety disorder in the adult population which suggests that metacognitions may mediate negative thinking by influencing whether a negative thought is interpreted as a reality. In this way, metacognitions act to cause and maintain anxiety through their influence on an individual's thoughts and subsequent behaviours. Esbjorn et al., (2013) established an association between metacognitions and anxiety in children in a study examining whether metacognitions can be assessed reliably in young people between the ages of 9 and 17 years. In relation to the use of CBT with young people to respond to SEMH difficulties, it is important to consider whether changes in metacognitive beliefs are related to positive outcomes.

Normann, Lonfeldt, Reinholdt-Dunne & Esbjorn (2016) evaluated treatment gains in CBT (reductions in levels of anxiety, negative thoughts and metacognitive beliefs) in a sample of 44 young people (7-12 years) who had been clinically identified as anxious and had completed a course of CBT. Anxiety levels, negative thinking patterns and metacognitions were all measured using psychometric scales and pre-, post- and follow-up data was gathered. Medium effect sizes were reported for all three variables for pre- to post-treatment. Forty-one families attended follow-up and results here showed a large effect size for anxiety levels (both child $d = 0.88$ and adult $d = 0.96$ reported) and metacognitions ($d = 0.87$) and a small effect size ($d = 0.37$) for data relating to negative thought patterns. These results lend support to the idea that altering metacognitive beliefs (how you think) may relieve levels of anxiety. This accords with the Metacognitive model described earlier (Wells, 2005). Mediation analysis found that the association between levels of anxiety and negative thought patterns may be influenced by a change in metacognitions whereby a young person's reaction to negative thoughts is altered and results in a new pattern of behaviour. However, this remains largely speculative at present and further research is needed to investigate how changes in metacognitions are brought about during CBT. *The Homunculi*, as a CBT based approach, may therefore aid a reduction in anxiety or an increase in self-control through helping the young person to identify how their thoughts are influencing their behaviour and helping them to choose a new strategy.

Adaptations of CBT

The increased use of CBT with young people has developed alongside an awareness that this approach needs to respond to their stage of cognitive development with, for example, an increased use of visuals being used (Attwood, 2003). For young people with ASD, it is also important to consider the linguistic and abstract thinking abilities required to engage with the process of CBT (Moree & Davis, 2010). Reaven, Blakeley-Smith, Culhane-Shelburne & Hepburn

(2012) present the following modifications of CBT to enhance accessibility: the use of creative tools such as drawing and photography, a focus on an individual's strengths and interests, opportunities for practice and repetition of taught strategies and the use of video to aid the generalisation of the concepts and skills developed. The NICE (2013b) guidelines reflect similar adaptations and also recommend emotion recognition training and the involvement of a parent or carer in the CBT sessions to aid and develop the use of the strategies by the young person. Wood et al., (2009) conducted an RCT trial which implemented a CBT program in schools modified for use with children with ASD so as to address poor social skills, defined interests (e.g. favourite animation characters), poor attention and motivation levels. Results lend some support to the modification of CBT approaches for young people with ASD with a large effect size (1.23) found for parent-reported reductions in anxiety post-treatment. Child-reported results were not significant however, with an effect size of 0.3. It is possible that using self-report measures with young people with ASD is hindered by reduced levels of emotional understanding which are characteristic of ASD, although findings related to this are mixed e.g. Chalfant et al., (2007) identified agreement, whereas Wood et al., (2009) identified differences between parent- and child-reported results. Although studies have indicated that existing self-report measures can be used appropriately with young people with ASD (Ozsvadjian, Hibberd & Hollocks, 2014) it would be useful for studies with larger sample sizes to be completed in order to increase the generalisability of findings.

Further research is still needed to look more closely at the effect of CBT modifications for young people in relation to SEMH difficulties which go beyond anxiety. A recent systematic review of CBT modifications for young people with ASD (Walters, Loades & Russell, 2016) gives support to the modifications recommended by NICE (2013b), but also identifies a potential benefit for modifications to be more 'disorder-specific'. However, research relating to transdiagnostic CBT approaches, as cited earlier, may suggest that this is not the case (Weiss et al., 2018). Indeed, The Homunculi has been designed to be flexible and adaptable to the needs of different individuals whilst still adhering to a set of CBT related principles (Greig & MacKay, 2013).

The Homunculi - studies by the authors

Having reviewed the evidence-base for CBT and metacognitive approaches, the Homunculi approach itself will now be considered. A single case study explored the application of The Homunculi approach with a 12 year old boy with Asperger's Syndrome over a 10 week period (Greig and MacKay, 2005). Pre- and post-measures were collected in relation to levels of depression, anxiety, anger and trauma using psychometric scales (Briere, 1996); child and parent reported social skills and competence assessments (Spence, 1998); and observational school data. Large effect sizes were reported for mental health scores, with levels of anxiety, depression and stress falling to below clinical thresholds. Social competence scores also indicated significant progress and this concurred with teacher observations.

Reference is made by the authors of The Homunculi to further research, completed by themselves, which implemented the approach with a group of 20 teenage boys with Asperger's syndrome. Results were published within a peer-reviewed conference poster

(MacKay and Greig, 2008). Improvements in mood across all measures were found with large effect sizes for depression (0.98), anger (0.97) and stress (0.95) and a medium effect size for anxiety (0.67).

Results from these two studies suggest that The Homunculi leads to positive gains for young people with Asperger's syndrome in relation to their SEMH difficulties. However, methodological limitations such as the small sample size and lack of control comparison means that these findings should be treated with caution. Future research should seek to increase the generalisability of findings by considering larger sample sizes, using control groups for comparison and exploring the implementation of The Homunculi with non-ASD populations.

Summary and Implications for Educational Psychologists

In summary, The Homunculi presents as a fun and engaging CBT approach which has been developed for use with young people with ASD and/or SEMH needs. It is built on a strong evidence-base in relation to the use of CBT approaches with young people and a growing evidence base in relation to the use of CBT with young people with ASD. Whilst the evidence base for The Homunculi itself is limited, findings from research completed by the authors (Greig & MacKay, 2005; 2008) suggests that the approach can be successfully used as a school-based CBT intervention. The use of creativity, individual interests, photography/video would all appear helpful and effective as a way of enabling the young people it is aimed at to engage with a CBT approach.

The Homunculi handbook should enable staff within schools to use the approach, although issues surrounding fidelity may then arise and it would be important to ensure that an understanding of the principles of CBT was afforded. Educational Psychologists would be well placed to support the implementation of The Homunculi in schools by providing staff training sessions or by working alongside school staff. Use of the approach with groups of young people may potentially address any issues of cost and time efficiency which may arise when negotiating the need for therapeutic work with young people in schools (evidence suggests that individual and group CBT with young people are similarly effective in the reduction of anxiety, e.g. Ung et al., 2015, although individual circumstances may mean that either an individual or group approach is preferable). Indeed, group CBT may offer an opportunity to also engage with positively influencing the experience of the school environment for the young people involved by normalising their SEMH difficulties and enabling a sense of belonging.

Consideration of the evidence suggests that The Homunculi is a suitable intervention for use within schools. In particular, the adaptations to CBT which are a central part of its design, would seem to match those identified in the NICE (2013b) guidelines to support the SEMH needs of young people with and without ASD. A reduction in levels of SEMH difficulties is pertinent to the well-being of young people. Further research into the maintenance of positive effects over time, linked to the effectiveness of possible adaptations (e.g. involvement of parents), should be encouraged to maximise the benefits of school-based CBT.

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Appendix: Systematic search criteria

I initially searched on Google Scholar for references to ‘The Homunculi approach.’ This led to the author’s handbook ‘The Homunculi Approach to Social and Emotional Wellbeing.’ From here, I was able to follow up on research completed by the authors (Greig & MacKay, 2005) but was unable to access the research referenced as MacKay & Greig (2008). I therefore contacted the authors who sent a copy of a peer-reviewed conference poster which detailed the research referred to. From here, it seemed appropriate to perform searches relating to CBT and metacognition, since these were the main psychological underpinnings referenced in The Homunculi.

Performing the searches identified in Table 1 below, using the ‘Psychinfo’ database, provided results from within the last ten years which focused primarily on school-based rather than clinical interventions. Since The Homunculi was initially developed as a CBT approach for young people with ASD, and with there being a wide literature on CBT approaches, my search initially focused on interventions targeted for ASD. Including a search for “school-based CBT” allowed me to also consider research on CBT approaches for young people which weren’t purely focused on young people with ASD. Another search which included CBT and metacognition was also performed in response to the metacognitive references made by the authors of The Homunculi in the handbook.

Table 1: Systematic search criteria

	Database used	Search keywords	Limits	Results	Most relevant results
4/5/18	Google Scholar	"The Homunculi Approach"			Greig, A., & MacKay, T. (2013). <i>The Homunculi Approach to Social and Emotional Wellbeing: A Flexible CBT Programme for Young People on the Autism Spectrum Or with Emotional and Behavioural Difficulties</i> . Jessica Kingsley Publishers.
11/5/18	Psychinfo	(cbt or "cognitive behavior* therapy") AND (children or adolescents or youth or child or teenager) AND (asd or autism spectrum disorder or autism)	2008-2018 Boolean Full text link	163	7 <ul style="list-style-type: none"> • Weiss et al 2018 • Iniesta-Sepúlveda, Marina 2018 (clinical CBT for yp with OCD – led to Ung et al 2015) • Maddox, et al 2017 • Clarke et al., 2017 (school based intervention) – led also to Wood et al., 2009 • Luxford, et al., 2017 (school based intervention) • Drmic et al., 2017 (school based – Singapore) • Burke et al., 2017 (Friends for Life intervention in school)
11/5/18	Psychinfo	(cbt or "cognitive behavior* therapy") AND (children or adolescents or youth or child or teenager) AND (asd or autism spectrum disorder or autism) AND school*	2008-2018 Boolean Full text link	57	7 <ul style="list-style-type: none"> • Reaven et al 2018 • Maddox et al. 2017 (as above) • Clarke et al. 2017 (as above) • Luxford et al., 2017 (as above) • Drmic et al., 2017 (as above)

					<ul style="list-style-type: none"> • Burke et al., 2017 (as above) • Ung et al., 2015
11/5/18	Psychinfo	(cbt or “cognitive behavior* therapy” AND metacogniti* AND children or adolescents or youth or child or teenager)	2008-2018 Boolean Full text link	15	1 <ul style="list-style-type: none"> • Normann et al 2016
11/5/18	Psychinfo	"school based CBT"	2008-2018 Boolean Full text link	24	3 <ul style="list-style-type: none"> • Drmic et al., 2017 • Mychailyszyn et al, 2012– a meta-analysis of youth cbt • Bernstein et al., 2009