

An Evaluation of the Use of the QbTest in the Leeds CAMHS
Neurodevelopmental Service: Efficiency, Clinical Utility, and
Acceptability

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1. Introduction

This service evaluation project (SEP) was commissioned by Dr Benedicte Eyre, Consultant Clinical Psychologist, within the Leeds children and adolescent mental health service (CAMHS) of Leeds Community Healthcare Trust. The evaluation sought to focus on the use of the Quantified Behavioural Test (QbTest) within the CAMHS neurodevelopmental (ND) assessment pathway for attention deficit hyperactivity disorder (ADHD) diagnosis. The QbTest is an objective testing system which measures levels of attention, impulsivity and motor activity and reports these against gender and age matched controls of people who do not have ADHD diagnoses. Leeds CAMHS began using the QbTest as part of their ADHD assessment process in January 2021 and wished to explore its efficiency, clinical utility, and acceptability.

2. Literature Review and Background

2.1 Service Context

Leeds CAMHS is commissioned to provide an ADHD assessment service. Young people of school age are referred for ND assessment and those accepted to the ND pathway are offered a comprehensive and holistic assessment tailored towards features of ADHD, autism spectrum disorder (ASD) or both.

In recent years, Leeds CAMHS has experienced a consistent yearly increase in the numbers of referrals received for children requiring ADHD assessment. By the end of 2019, this had resulted in long waiting times of around 40 weeks. The decision was made to begin using the QbTest as part of the ADHD assessment process, in the hopes that it would increase the efficiency of the process, as it had been found to do in other NHS CAMHS services (Hall, Selby, et al., 2016). It was hoped that the QbTest would achieve this by replacing the need for time-consuming school observations, and by assisting with the ruling out of ADHD early on in complex assessments, shortening the process. It was also hoped the QbTest would provide an objective, standardised component to the assessment process, in contrast to subjective clinician observations of young people in a school setting.

The QbTest was introduced to Leeds CAMHS in January 2021. It is important to note the difficulty in a direct comparison between waiting times and length of assessment processes before and after the introduction of the QbTest, due to the impact of the COVID-

19 pandemic. Between March and September 2020, all neurodevelopmental assessment work was stopped in Leeds CAMHS due to staff being redeployed from routine to urgent risk and crisis related work. When assessments were re-started, they had to be completed in accordance with social distancing and PPE guidelines, using remote video technology where possible.

As well as this, in September 2020, the service integrated their ADHD and ASD assessment pathways, meaning that all young people referred for any kind of ND difficulty joined the same waiting list for assessment. It is likely that this had some impact on waiting times and length of assessment processes.

2.2 ADHD Assessment and Objectivity

ADHD is most commonly described as a neurodevelopmental disorder characterised by difficulties with inattention, hyperactivity and impulsivity. It can also be understood as a combination of personality traits and cognitive styles which often causes difficulty in situations, such as school, where people are expected to behave and think in certain ways (Weiss, 1985). Regardless of debates around the definition or diagnostic validity of ADHD (Johnstone & Boyle, 2018), currently accepted practice within the NHS is that young people experiencing persistent behavioural or attentional difficulties suggestive of ADHD are referred for diagnostic assessment based on criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 2013). Guidelines set out that this assessment should include the taking of a full developmental and psychiatric history, as well as reports and observations of the person's behaviour and mental state in different settings. It may also include, but should not be limited to, the use of rating scales (National Institute for Health and Care Excellence [NICE], 2019).

Questions have been raised about potential limitations in the standard diagnostic process due to the subjectivity of commonly used assessment methods (Achenbach et al., 1987; Van Der Ende & Verhulst, 2005). Reports and observations are normally carried out by family members, teachers, and clinicians within psychology services. It stands to reason that their assumptions, previous experiences, and knowledge and expertise around ADHD will impact their judgement and subsequent diagnostic decision making (De Los Reyes et al., 2011). Some argue that this results in a more rounded assessment process, with a more holistic picture presented of young peoples' differing behaviours, strengths, and difficulties

across contexts (De Los Reyes et al., 2015). This argument is perhaps most salient for the inclusion of reports from various stakeholders and professionals. When considering the subjectivity of the final decisions made by clinicians reviewing the various reports and observations, there emerges an argument for the inclusion of objective assessment measures (Emser et al., 2018).

2.3 The QbTest

It has been argued for some time that computerised measures of attention and impulsivity, using visual stimuli and response buttons, can provide a useful addition to the ADHD assessment process (Klee & Garfinkel, 1983). A variety of these 'continuous performance task' (CPT) tests exist, of which the QbTest is one. Alongside attention and impulsivity, the QbTest carries an additional measure of hyperactivity by recording the movements of a reflective marker placed on user's foreheads. Scores are reported against a data set of young people, matched for age and gender, who do not have ADHD (Hall, Valentine, et al., 2016).

Reported reliability and validity figures for the QbTest vary. One study with a sample of 182 children found of those identified as having ADHD by the QbTest had a 76-86% chance of actually having ADHD, and of those given a negative test result had a 37-50% chance of not having a diagnosis (Hult et al., 2018). Another large sample study found significant positive correlations between QbTest scores and parent and teacher ratings of hyperactivity and impulsivity. A significant negative correlation was found between QbTest scores of inattention and IQ test scores, on which attention is required to perform highly (Reh et al., 2015). As could be expected, QbTest results did not correlate with parent and teacher reports of peer relations, demonstrating the QbTest's inability to detect the full range of difficulties which may be present for young people with ADHD. In a comparison of assessments completed with and without the use of the QbTest, seven of a total 46 participants in the non-Qb condition had their diagnosis revised from non-ADHD to ADHD within one year, in comparison to none of the 62 participants in the Qb condition (Vogt & Shameli, 2011). These results are all suggestive of the QbTest providing a useful, additional source of information in diagnostic decision making, but not that it should be used in isolation.

3. Aims

This SEP had two main aims. The first was to determine if using the QbTest, rather than the previously used method of observing the young person at school, resulted in a more efficient assessment process, in terms of time taken between first contact with the service and diagnosis, and clinician input. The second was to explore staff opinions about the clinical utility and acceptability of the QbTest as a component of the assessment process. It was hoped that the results of the SEP would allow the CAMHS service to make an informed decision about the continuation of the use of the QbTest and its related costs.

4. Method

4.1 Design

A mixed methods design was chosen for this SEP in order to address both of the project aims. A design which involved only looking at either quantitative or qualitative data alone would not have provided the service with adequate information on which to make decisions about the continued use of the QbTest.

4.2 Participants and Data Collection

4.2.1 *Quantitative Data Collection and Analysis*

Cases for the quantitative analysis were identified by running reports on the Leeds CAMHS case management system. These reports identified all 93 completed and recorded assessments which used the QbTest, 39 of which were given a diagnosis of ADHD and 54 which were not. Data sets were then created using the 39 most recently completed cases for the following four conditions: Pre-QbTest ADHD diagnosis, pre-QbTest no diagnosis, post-QbTest ADHD diagnosis, post-QbTest no diagnosis. Cases which were assessed by an external service, commissioned by the NHS to reduce waiting lists, were ruled out due to these not being worked on by the Leeds CAMHS team.

Reports detailed the number of days between first contact with the service and diagnostic decision for each case. Descriptive statistics were used to demonstrate comparisons between cases carried out pre- and post- introduction of the QbTest, and pre- and post- COVID 19. It was planned to use pre- post- independent samples t-tests to make comparisons of pre- and post-QbTest assessment lengths. This was not possible due to the significant impact of extraneous variables on the data. In the year prior to and after QbTest introduction, many cases were significantly disrupted due to a cease in all

assessments during the COVID-19 pandemic, changes in assessment clinic structure, assessments shifting to working online and school closures. Statistical analysis on data across such varied conditions would not present a true picture of the efficiency of the assessment process using the QbTest.

It was planned to also gather data on the amount of staff time spent on each case, across all four conditions. A cyberattack on the Leeds CAMHS case management system made this impossible. At the time of submitting this report, this information was still inaccessible. In discussion with the commissioner of this project, waiting for this data was considered but decided against. Knowing that the quality of the data was likely compromised, as detailed in the paragraph above, influenced this decision. The timescale for this data being accessible was unknown at the time of submitting this report, also contributing to the decision to complete the project and present the available results in a timely manner.

4.2.2 Qualitative Participants, Data Collection and Analysis

Participants were recruited from the neurodevelopmental assessment team within Leeds CAMHS. Thirteen team members agreed to take part in the research. Due to the focus on the staff team's experience of using the QbTest, these were the only people eligible for inclusion.

To explore staff opinions, two 30-minute-long focus groups, using a semi-structured question schedule (see Appendix A), were carried out with staff members from the ND assessment pathway. Individual interviews with staff members were considered but the service manager suggested focus groups during monthly team meetings. Focus groups were chosen due to the ease of meeting with most team members at one time and this not taking time away from their clinical work.

Rapid Qualitative Analysis (RQA) was used to analyse the data gathered during the focus groups for emergent themes. Thematic analysis was considered due to its ability to summarise qualitative data in rich detail (Braun & Clarke, 2006); however it was decided that RQA would fit better within the time constraints of this mixed methods project. This decision was in keeping with the stance of pragmatism used in this research. In contrast to strictly positivist or interpretivist perspectives, pragmatism centres the focus of the research on using the data in the best way possible to achieve the goals of the research and solve the

problem at hand (Yvonne Feilzer, 2010). Themes and subthemes were credibility checked by a group of peers on the Doctorate in Clinical Psychology who were also using RQA for their projects.

4.3 Ethics

Ethical approval was sought from the Doctorate in Clinical Psychology Research Ethics Committee at the University of Leeds (DClinREC 21-016) and obtained on 31st July 2022.

5. Results

5.1 Descriptive Data

As discussed previously, the QbTest was introduced during a period of significant disruption for the service. The pre- and post-Qb data sets occurred during such differing circumstances that most statistical analysis would be unable to provide a useful and accurate comparison of assessment lengths across the two conditions.

For all 78 pre- and 78 post-Qb cases, the available data showed; the date a case had its first contact with the service (start date), the date of diagnostic decision (diagnosis date), and the number of days between these. The only useful information which could be taken from this data was the mean, median, and range of the total number of days between start date and diagnosis date for all cases in each condition. However, due to the impact of the COVID pandemic, simply comparing the pre- and post-Qb data is unhelpful. The mean figures in Table 1 would suggest that use of the QbTest results in a longer average assessment process, with the median and range for both conditions demonstrating a highly variable data set.

Table 1

Mean, Median, and Range for Days Between Start Date and Diagnosis Date pre- and post-QbTest

	Before QbTest	Using QbTest
Mean - Days Between Start and Diagnosis	101	169
Median - Days Between Start and Diagnosis	72	133.5
Range - Days Between Start and Diagnosis	385-0 (385)	537-41 (496)

To better understand the impact of both the COVID pandemic and use of the QbTest, the data set was separated into different time periods. This is demonstrated in detail in Appendix D. Four cases, two pre-QB and two post-Qb, had their start date just before or during the time the service was shut down due to the pandemic. These have been treated as anomalies as other than these four, assessments did not take place during this time, meaning the four cases are not representative of the way the service operated for any significant period.

All but two of the pre-Qb cases occurred prior to the COVID pandemic and were therefore assessed under usual service conditions at the time. 44 of the 78 post-Qb cases occurred during a period of disruption in the 10 months after assessments recommenced, post pandemic. During this period, from September 2020 until July 2021, assessments took place but under unusual circumstances with staff having to adjust to online working, the strict use of PPE and social distancing, high rates of COVID in staff and client populations, lockdowns and related restricted movement contributing to difficulties and delays in the assessment process. The remaining 32 post-Qb cases took place during a period which could reasonably be considered post-COVID, from August 2021 onwards. By this stage COVID rates were lower, all lockdowns had ended, staff had been through 10 months of adjustment to new working practices and rules around PPE use, social distancing, and movement had been relaxed. Although the data is imperfect and subject to a range of influences, a comparison of the pre-COVID, pre-QbTest and post-COVID, QbTest means demonstrated in Table 2 can perhaps give some indication that the QbTest itself may not have resulted in a longer

average assessment process. The medians and ranges recorded in Table 2 demonstrate the variability of the data in the pre-COVID & pre-QbTest, and disrupted period conditions, with variability decreasing under the third period, when the service was most free from disruption.

Table 2

Mean, Median, and Range for Days Between Start Date and Diagnosis Date, Split by Time Period

	Pre-COVID & Pre-QbTest	Disrupted Period & Using QbTest	Post-COVID & Using QbTest
Total Cases Included in Condition	76	44	32
Mean - Days Between Start and Diagnosis	99	210	90
Median - Days Between Start and Diagnosis	70.5	192	92.5
Range - Days Between Start and Diagnosis	385-0 (385)	443-42 (401)	178-41 (137)

As can be seen in Table 2, the limited number of completed and recorded post-COVID, post-Qb cases results in results being drawn from data sets of differing sizes. Table 3 demonstrates results using the 32 available post-COVID cases and 32 randomly selected cases from the other conditions, with similar results as in Table 2.

Table 3

Mean, Median, and Range for Days Between Start Date and Diagnosis Date for the Selected Cases

	Pre-COVID & Pre-QbTest	Disrupted Period & Using QbTest	Post-COVID & Using QbTest
Total Cases Included in Condition	32	32	32
Mean - Days Between Start and Diagnosis	90	213	90
Median - Days Between Start and Diagnosis	48	201	92.5
Range - Days Between Start and Diagnosis	385-42 (343)	443-42 (401)	178-41 (137)

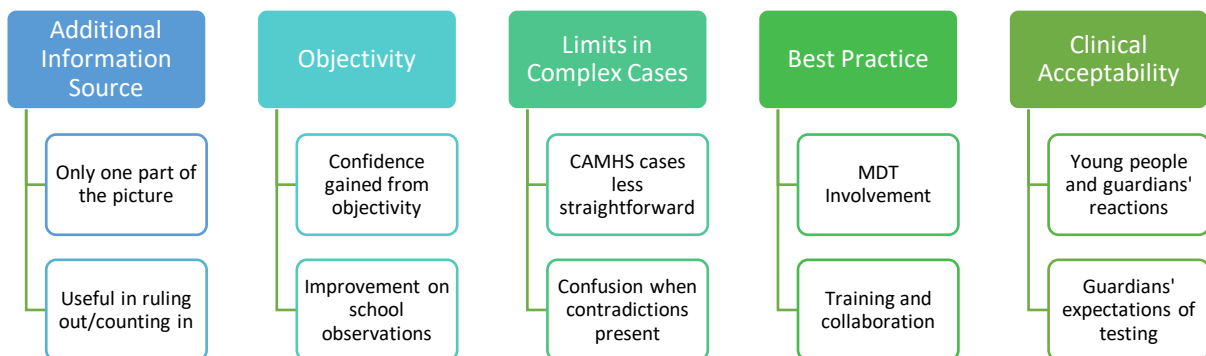
It is also worth noting that all post-Qb cases were conducted under the new, integrated neurodevelopmental assessment pathway, in contrast to 4 of 78 pre-Qb cases which came under this new structure. It is unclear exactly how this variable will have impacted the data but is likely to have done in some way.

5.2 Qualitative Analysis

Rapid qualitative analysis was carried out on recordings of both focus groups, using an inductive, data-driven approach using guidelines set out by Vindrola-Padros and colleagues (Vindrola-Padros et al., 2020; Vindrola-Padros & Johnson, 2020). Each question was given a domain name, relating to the area it was hoping to address and a template created (see Appendix B). Whilst listening to the interview recordings, key points, responses, and quotes were noted next to the domain name they related to. From this summary, five main themes, each with sub-themes, were identified: 1. Additional Information Source, 2. Objectivity, 3. Limits in Complex Cases, 4. Best Practice, 5. Clinical Acceptability, as can be seen in Figure 1. Each theme and its sub-themes will be covered in detail below.

Figure 1

Diagram of Five Themes and Each of Their Two Sub-themes



5.2.1 Additional Information Source

Participants reported that the QbTest was a useful and valuable source of additional information which could be used in diagnostic decision making.

“...have found it helpful as another source of information, especially with thinking about concentration...the hyperactivity, impulsivity, often we see that quite clearly, but concentration difficulties may be easier to mask.”

Although, having more information was universally seen as valuable, participants emphasised the importance of viewing the QbTest results as **only one part of the picture**, and not over-relying on them. Some also spoke about feelings of frustration as they realised the QbTest was not able to provide black and white diagnostic answers as they had thought before learning more about it.

“Remember it’s just a tool...you’ve got to look at it as a snapshot with all of the other variables. It’s not black and white...it does have its frustrations”

“It works well when it’s used as an additional tool...taking it into account as we do the rest of the assessment information.”

The QbTest was found particularly helpful in cases where a young person was referred predominantly with difficulties associated with ASD. In these cases, ADHD could often be **ruled out or counted in** for consideration with the use of the QbTest.

“A place where it has its use is in dual diagnosis, when autism is there, and they ace the Qb. It then gives you a robust report...your child has all of these needs, but it’s part of their autism profile...we can rule out ADHD.”

5.2.2 Objectivity

The role of the QbTest as an objective measure was brought up by various participants, with the addition of an objective view being valued in diagnostic decision making. Participants reported feeling more **confident in their decision making** when they could consider QbTest results alongside other evidence.

“It’s helpful to have something that is an objective look because all our judgements as clinicians will be impacted by assessments we’ve done before.”

“...overall probably feel more confident just for having an extra good tool to use.”

The objectivity of the QbTest was compared to school observations, the previous method used. It was expressed by participants that the standardised and objective nature of the **QbTest was an improvement.**

“...helpful that it's standardized, when you haven't done the school observation yourself and you've relied on someone else to do it, you're not there and you don't know quite what the setup was, even if they describe it... You're dependent on the day... the lesson that was happening... the school that you're in.”

5.2.3 Limits in Complex Cases

Participants explained that a number of ND assessments are outsourced to an external service, due to long NHS waiting lists. Assessments which are deemed more complex due to young people having additional needs related to factors like mental health difficulties, learning difficulties, and trauma are generally carried out within CAMHS. The usefulness of the QbTest was reported to have limitations in these circumstances. Participants spoke about assessment and diagnostic decision making, including the interpretation of the QbTest, being **less straightforward in CAMHS** than in the general

population. Participants found the QbTest more helpful, and to have fewer limitations in comparing young people with and without ADHD, who do not have additional needs.

“We’re mainly seeing the complex cases, young people with anxiety and trauma which can cause false positives, it’s less straightforward.”

“I’m still undecided if it is that useful, sometimes it is, sometimes not”

The diversity of young people, difficulties, and needs assessed in CAMHS was also found at times to create **contradictions between the different sources of information** available to clinicians. This was experienced as creating more confusion, particularly when the QbTest results did not align with other measures.

“...for families that can be very confusing...if they score on the Qb but we say no they haven’t got ADHD, it can be tricky for us to justify that position”

“You get false positives for lots of different reasons, and we have that job then trying to explain why they are scoring on the Qb but we don’t think that [ADHD] is their primary issue.”

5.2.4 Best Practice

Participants spoke about the ways in which the QbTest should be used to ensure best practice. They spoke about the importance of gradually gaining experience in interpreting and taking time to get to know how to use the test. Participants reported that **collaboration between more and less experienced clinicians**, as well as **input and training from Qb Tech** were key to best practice.

“You do need the support from the Qb Tech team to interpret all the variables”

“It’s a gradual road...there is more to learn”

In interpreting test results and observations of the young person from during the test, participants spoke about an **MDT approach** being essential, with their detail and depth being better understood and analysed by a variety of clinicians of differing professions.

“I would not want to interpret it by myself, I think it needs an MDT approach.”

5.2.5 Clinical Acceptability

Participants reported that the vast majority of young people and families are able to access the QbTest without difficulty. Most **young people were reported to find the QbTest fine or boring**, with a smaller number finding it fun. Guardians were **reported as mostly knowing what to expect and seeming relaxed about their child attending**.

“most young people say afterwards that it was OK or boring, I’ve had one or two who have said they’ve enjoyed it”

Participants spoke about a number of guardians **expecting results immediately** after the test, thinking that the test provided a clear diagnosis right away. This mirrors the expectations of some staff about the scope of QbTest results, prior to them becoming more familiar with using and interpreting them.

“Most seem quite relaxed about the child coming to do the test. But I think a lot of parents seem to ask will we find out a result today.”

6. Discussion

6.1 Summary of Results and Conclusion

6.1.1 Quantitative

The complexity of the situation that Leeds CAMHS faced in adapting to the COVID-19 pandemic, an eventual move to online working, social distancing, lockdowns, restrictions on movement, and school closures is reflected in the quantitative data. At face value, it could be expected that the QbTest would increase efficiency due to clinicians not having to travel to administer it, or face delays dictated by school schedules. The data available is simply not able to demonstrate whether this is the case or not, due to the number of extraneous variables at play.

The main conclusion which can be drawn from the available data, is that a comparison is needed during a period in which the service is operating in a consistent way, without major disruptions. The results may very tentatively suggest that using the QbTest likely does not make the assessment process longer, but ultimately, further evaluation is needed to determine this.

6.1.2 Qualitative

The aim of the qualitative element of this SEP was to explore staff views on the clinical utility and acceptability of the QbTest. The emergent themes suggest that staff members found the QbTest clinically acceptable and that it certainly had utility in their assessment process. Research conclusions support Leeds CAMHS staff views that the QbTest should form one part of a robust assessment process involving a variety of experienced clinicians (Hult et al., 2018). It appeared from the focus group discussions that staff had perhaps expected or hoped that the QbTest would provide more clear-cut answers to the diagnostic question. This may be the case in many 'straightforward' assessments where other factors are not present. Research is needed on the ability of the QbTest to distinguish between signs of ADHD and difficulties involving attachment, trauma, psychological distress, learning difficulties and other forms of neurodiversity (Reh et al., 2015). It could be argued that this level of complex understanding is beyond the scope of a test such as the Qb, but research in this area would be useful regardless.

In the complex assessments which Leeds CAMHS are carrying out, there was a definite sense that the QbTest had its limitations, much like all sources of diagnostic information. Although the QbTest was not seen to provide total clarity, it was generally regarded as useful and important in adding an objective and standardised viewpoint for consideration in assessment. This conclusion is mirrored in previously discussed research into the validity and reliability of the QbTest which concludes that its intended use should be as a complement to other measures of assessment (Bolea-Alamañac et al., 2014; Hult et al., 2018).

Staff spoke about the particular utility of the QbTest in assisting with assessments for young people presenting with mainly ASD related characteristics. Findings differ on the utility of the QbTest in differentiating between ASD and ADHD, or on being able to pick apart the influence of each in people with both. Some studies align with the opinions reported in this evaluation, that response patterns on the QbTest are distinctive between young people who receive diagnoses of ASD and ADHD (Groom et al., 2016; Hall et al., 2017). Others report overlap between the QbTest profiles of young people with ASD, ADHD or both (Hult et al., 2018). An expert consensus report on ADHD and ASD diagnosis highlights the commonality of overlap of symptoms or co-occurrence of both conditions and

recommends both are considered and explored comprehensively across all aspects of the assessment process for anyone referred for either (Young et al., 2020). Others argue that a focus on specific diagnoses and conditions is pathologising and unnecessary, favouring an approach based on person-centred, individual forms of neurodiversity (Tait, 2001).

Although not directly mentioned by participants, strengths and limitations of measures like the QbTest across gender and ethnicity are important to consider. Research demonstrates lower rates of positive diagnosis in girls with ADHD (Quinn & Madhoo, 2014; Taylor et al., 1992). Emerging research around the use of CPTs, particularly the QbTest, demonstrates a strength in picking up on signs of ADHD in girls, compared to gender specific normative samples (Hall et al., 2017; Vogt & Shameli, 2011). This may provide an advantage over subjective observations of girls in a school setting where comparisons to boys, more likely to display overtly hyperactive behaviour, and masking of hyperactivity may obscure difficulties associated with ADHD (Lai et al., 2022).

Data on the ethnicity of participants used to create normative data for the QbTest are not publicly available with nothing reported by Qb Tech suggesting that it has been validated in non-western cultural contexts (Qbtech, 2020). The expert consensus guidelines recommend the consideration of cultural differences in behaviour and interaction in the assessment of ADHD (Young et al., 2020). Existing UK research demonstrated teachers rating levels of hyperactivity higher in Asian than in white children (Sonuga-Barke et al., 1993). Although the objectivity of the QbTest would suggest an advantage in such situations, clinicians completing observations of young people taking the test, and interpreting the results must still consider the impact of their own biases and assumptions in relation to race and culture.

6.2 Limitations

Clear limitations in the quantitative data are covered in the results and conclusion section above. A project with a longer timescale could have addressed these by waiting for data less constrained by extraneous variables. This idea will be developed in the recommendations.

As discussed previously, it was not possible to conduct the full quantitative analysis which was planned due to a cyberattack on the Leeds CAMHS case management system.

Although this was not something within the control of this project, the addition of this data would have added value to the results, although the same limitations just discussed would have applied.

Qualitative data gathering for the project was limited to two 30-minute focus groups. All participants stated that they had no more to add by the end of the 30 minutes, potentially a sign of data saturation. It could also be that longer focus groups would have led to more in-depth discussions and responses. This project was limited to capturing staff views at one point in time. The QbTest had only been in use at Leeds CAMHS for around one and a half years at the time focus groups took place. It may be that staff views had changed in the time since its introduction and may continue to change and develop as the team gains more experience with the QbTest.

6.3 Recommendations

Figure 2

Diagram of Recommendations



6.3.1 Continued Use of the QbTest

It is important to recognise the difficulties associated with school observations when considering the utility of the QbTest. As discussed previously, the subjective nature of one clinician observing a young person and reporting back to the MDT is relevant. Clinicians' observations and interpretations of behaviour will be influenced by the behaviour of young people they have observed before, how many observations they have completed previously, their own internal assumptions and expectations about behaviour and social interaction (DuPaul & Stoner, 2014). Beyond this, schools and class environments vary greatly even within one city area. Young people may present differently depending on the behaviour of their peers, the style of their teaching staff and even the particular classes which occur during the observation (DuPaul & Stoner, 2014). On a practical level, school observations cannot take place outside of term time, significantly limiting assessments during these periods, and involve time consuming and costly travel time for clinicians.

The combination of these factors, alongside the clinical utility and acceptability of the QbTest, demonstrated in the results of this project, lead to a recommendation for continued use of the test within Leeds CAMHS.

6.3.2 Further Quantitative Analysis with Comparison Group

As detailed above, the quantitative element of this project was constrained due to contextual issues around service structure, a cyberattack, and the COVID-19 pandemic. Further analysis during a more settled period would be beneficial. Structural changes the service has gone through, as well as the impact of changes in staffing levels over time, and the backlog created by the COVID pandemic would create difficulty in comparing a current data set to one collected pre-COVID and pre-Qb. Perhaps the most robust and accurate analysis would involve comparison of two sets of upcoming cases, half using school observations, half the QbTest. This would account for a variety of extraneous variables in the historic data, including online vs. face-to-face contacts, the impact of the COVID-19 pandemic, changes to the neurodevelopmental pathway, differences in staff confidence in using the QbTest between its introduction and now, and general changes in staffing.

As well as evaluating the efficiency of the QbTest in the assessment process, a further project could perhaps consider the perceived value of clinical contact young people access under different assessment conditions. Young peoples' and guardians' opinions may

demonstrate whether taking the QbTest might provide some clinical value in itself, in comparison to school observations.

6.3.3 Further Training and Development

The findings point to a sense of difference in the clinical utility of the QbTest between straightforward and complex assessments, a sense that representatives from Qb Tech seemed to share with Leeds CAMHS staff. There is very limited research addressing the use of CPTs for young people with a range of needs and difficulties (Reh et al., 2015). Certainly, further research in this area is warranted and required. On a service level, this is perhaps something which could be thought about further by Leeds CAMHS and Qb Tech. Further development of an understanding of how best the QbTest can be used and interpreted in these cases could be used to create a working model or training for CAMHS staff. This could also perhaps be incorporated into a further service evaluation project.

6.4 Dissemination

The results of this SEP have been shared at the yearly Leeds DCLinPsy SEP conference in October 2022. The conference poster and presentation and this report have been shared with the commissioner at Leeds CAMHS. The results will also be presented at an upcoming monthly CAMHS neurodevelopmental team meeting.

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8. Appendices

8.1 Appendix A

Provisional Interview Schedule for Neurodevelopmental Team Members

Provisional Focus Group Schedule for: An evaluation of the use of the QbTest in the Leeds CAMHS neurodevelopmental service: efficiency, clinical utility, and acceptability

After going through the participant information sheet again, I want to remind you that these responses will not be shared with anyone until they are anonymised. They won't have any effect on your work, pay or contract. The questions will focus on your experience of conducting ADHD assessments and if the introduction of the QbTest has impacted this.

Icebreaker/introductory questions

Quickly go around and each say how long have you been working in the ND assessment team at Leeds CAMHS and what your role in the team is?

We don't have a lot of time so I'd just encourage everyone sharing any thoughts they have, discussion between each other, I might ask follow up questions or move us on to the next if needed but will leave it mostly up to you to shape.

Main questions

Start of quite generally: What has it been like for you as clinicians to use the QbTest and its results as part of the assessment process?

Prompts: Has anything about it been helpful/unhelpful?

How important or useful do you feel the QbTest is in the assessment process?

Why is that important/not important? What does that add/take away to/from the process?

Has the QbTest changed anything about how you make final decisions in the assessment process?

Prompts: In what way has that been different to before?

Do you feel your ability to make and feel confident with decisions on diagnosis has changed since using the QbTest?

What has made that easier/more difficult?

Is there anything about using the QbTest that we haven't covered which you think is important to talk about?

Start off quite generally: What has it been like for you as clinicians to administer the QbTest?

Prompts: Has anything about it been easy/difficult?

Have any of you worked in the team before and after the Qb was introduced? If so, what have you noticed?

Prompts: In what way has that been different to before?

Do you get a sense of how children find the QbTest? Does this vary a lot?

What makes it that way? What about the process do you think causes that?

What is it like for you to work with children and parents when administering the QbTest?

Is there anything about using the QbTest that we haven't covered which you think is important to talk about?

8.2 Appendix B

Blank Template for Rapid Qualitative Analysis

Transcript Summary from Focus Groups

Question	Domain (neutral domain name)
<p>What has it been like for you as clinicians to use the QbTest and its results as part of the assessment process?</p> <p>Prompts: Has anything about it been helpful/unhelpful?</p>	<p>Clinician experience of using the Qb.</p>
<p>What has it been like for you as clinicians to administer the QbTest?</p> <p>Prompts: Has anything about it been easy/difficult?</p>	
<p>How important or useful do you feel the QbTest is in the assessment process?</p> <p>Why is that important/not important? What does that add/take away to/from the process?</p>	<p>Importance and Utility of the Qb.</p>
<p>Do you feel your ability to make and feel confident with decisions on diagnosis has changed since using the QbTest? / How confident do you feel making decisions on diagnosis, using the QbTest as part of this?</p>	<p>Confidence in diagnostic decision making.</p>

Do you get a sense of how children find taking the QbTest?	Clinical acceptability of the Qb.
Do you get a sense of how parents find the process?	
Is there anything about using the QbTest that we haven't covered which you think is important to talk about?	Additional information.

Focus Group Transcript Summary
Clinician experience of using the Qb:
Importance and Utility of the Qb:
Its contribution to confidence in diagnostic decision making:
Clinical acceptability of the Qb:
Additional information:

Theme	Sub-themes				
Additional source of information	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				
Objectivity	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				
Limits with complex cases	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				
Best Practice	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				
Acceptability of administration	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				

8.3 Appendix C

SEP Commissioning Form



Doctor of Clinical Psychology Training Programme

Service Evaluation Project Commission form

Proposed title	An evaluation of the use of the QbTest in the Leeds CAMHS neurodevelopmental service: Efficiency, clinical utility, and acceptability
Your Name	Dr. Benedicte Eyre
Your Job Title	Consultant Clinical Psychologist
Address	
Phone No	
E-mail	
Background information about the project	ADHD assessments in CAMHS have historically involved elements of rather subjective judgements, a lengthy and prolonged assessment and information gathering process and ongoing discussions re what should constitute core components of a clinically robust assessment. The Qb computerised child assessment has recently been introduced into the pathway, with the hope of achieving the following: a.) shortening the time of the assessment, hence improving through put and providing a timelier outcome for service users and b.) the quality of the assessment
Proposed project, likely method and rough idea of numbers involved	The project would involve 2 main components: Quantitative data gathering regarding ADHD assessments pre and post the introduction of the Qb. Statistical analysis of matched data sets.

	Qualitative data gathering from clinicians around the experience of the Qb assessment (qualitative analysis e.g., using IPA or content analysis)
Expected timescale of the project	November 2021 - September/October 2022
Who will be supervising the project?	Dr. Benedicte Eyre (external)
What resources will be provided by the commissioning service	Access to data and help with analysis Admin/ IT support Access to staff
Where will the project be located?	Leeds CAMHS
How many trainees is this project for?	1
Do you anticipate this project will need NHS ethical approval? If yes, what stage are you currently at?	Unlikely. I will shortly liaise with our R and D dpt.

8.4 Appendix D

Full Data Set with Different Time Periods Highlighted

Carried out pre-COVID
Carried out during COVID shutdown period
Started during first ten months after re-starting assessments , country still in lockdown
Carried out after national lockdowns ended , at least ten months since start of post-COVID assessments

Pre-Qb Number of Days Between Start and Diagnostic Decision				Post-Qb Number of Days Between Start and Diagnostic Decision			
Start Date	Diagnosis Date	Days Between		Start Date	Diagnosis Date	Days Between	
18-Sep-17	17-Jul-18	302		24-Mar-20	06-Jul-21	469	
02-Oct-17	27-Jul-18	298		01-May-20	20-Oct-21	537	
30-Oct-17	03-Sep-18	308		17-Nov-20	03-Feb-22	443	
06-Nov-17	01-Aug-18	268		30-Nov-20	23-Aug-21	266	
06-Nov-17	25-Jul-18	261		18-Jan-21	30-Jun-21	163	
20-Nov-17	10-Dec-18	385		26-Jan-21	16-Sep-21	233	
05-Feb-18	23-Jul-18	168		09-Feb-21	11-Jan-22	336	
05-Feb-18	10-Sep-18	217		09-Feb-21	23-Sep-21	226	
19-Feb-18	03-Dec-18	287		01-Mar-21	03-Feb-22	339	
05-Mar-18	16-Jul-18	133		03-Mar-21	17-Jun-21	106	
13-Mar-18	17-Oct-18	218		04-Mar-21	20-Feb-22	353	
03-Apr-18	14-Aug-18	133		04-Mar-21	11-Dec-21	282	
30-Apr-18	17-Jul-18	78		10-Mar-21	06-Jan-22	302	
21-May-18	02-Aug-18	73		10-Mar-21	31-Oct-21	235	
12-Jun-18	23-Jul-18	41		11-Mar-21	25-Nov-21	259	
13-Jun-18	03-Sep-18	82		17-Mar-21	10-Sep-21	177	
14-Jun-18	13-Aug-18	60		18-Mar-21	03-Feb-22	322	
18-Jun-18	19-Sep-18	93		25-Mar-21	06-Oct-21	195	
18-Jun-18	06-Aug-18	49		30-Mar-21	28-Sep-21	182	
21-Jun-18	19-Nov-18	151		01-Apr-21	15-Feb-22	320	
25-Jun-18	03-Jun-19	343		07-Apr-21	19-Jan-22	287	
25-Jun-18	10-Aug-18	46		07-Apr-21	17-Nov-21	224	
05-Jul-18	19-Feb-19	229		12-Apr-21	18-Oct-21	189	
05-Jul-18	01-Aug-18	27		15-Apr-21	29-Jul-21	105	
05-Jul-18	23-Jul-18	18		19-Apr-21	25-Nov-21	220	
19-Jul-18	17-Oct-18	90		19-Apr-21	27-Sep-21	161	
19-Jul-18	19-Jul-18	0		19-Apr-21	24-Sep-21	158	
19-Jul-18	19-Jul-18	0		21-Apr-21	14-Sep-21	146	
28-Aug-18	04-Dec-18	98		26-Apr-21	21-Sep-21	148	
17-Sep-18	31-Oct-18	44		27-Apr-21	06-Oct-21	162	
09-Oct-18	06-Dec-18	58		27-Apr-21	06-Jul-21	70	
10-Oct-18	16-Oct-18	6		28-Apr-21	08-Dec-21	224	
22-Oct-18	29-Oct-18	7		28-Apr-21	09-Jun-21	42	
24-Oct-18	21-Dec-18	58		07-May-21	01-Sep-21	117	
30-Oct-18	08-Oct-18	-22		10-May-21	27-Sep-21	140	
05-Nov-18	14-Dec-18	39		14-May-21	10-Feb-22	272	
05-Nov-18	30-Apr-19	176		17-May-21	21-Jul-22	430	
05-Nov-18	22-Nov-18	17		18-May-21	27-Jul-21	70	

06-Nov-18	03-Dec-18	27
13-Nov-18	10-Dec-18	27
14-Nov-18	14-Dec-18	30
10-Dec-18	02-Jul-19	204
12-Dec-18	12-Dec-18	0
07-Jan-19	30-Jan-19	23
14-Jan-19	25-Mar-19	70
14-Jan-19	26-Mar-19	71
14-Jan-19	30-Jan-19	16
21-Jan-19	06-Feb-19	16
24-Jan-19	09-Apr-19	75
25-Jan-19	15-Aug-19	202
28-Jan-19	17-Apr-19	79
29-Jan-19	24-May-19	115
04-Feb-19	22-Jul-19	168
04-Feb-19	10-Jun-19	126
18-Feb-19	25-Mar-19	35
11-Mar-19	10-Jun-19	91
24-Apr-19	10-Jun-19	47
27-Apr-19	29-May-19	32
29-Apr-19	10-Jun-19	42
01-May-19	25-Sep-19	147
01-May-19	17-Jun-19	47
08-May-19	23-Oct-19	168
08-May-19	10-Jun-19	33
22-May-19	11-Sep-19	112
21-Aug-19	04-Sep-19	14
21-Aug-19	11-Sep-19	21
27-Aug-19	01-Oct-19	35
27-Aug-19	01-Oct-19	35
28-Aug-19	04-Sep-19	7
03-Sep-19	03-Dec-19	91
24-Sep-19	19-Nov-19	56
09-Oct-19	09-Jan-20	92
15-Oct-19	04-Feb-20	112
30-Oct-19	18-Mar-20	140
11-Dec-19	24-Jan-20	44
07-Jan-20	11-Feb-20	35
07-Jan-20	10-Jun-20	155
25-Feb-20	19-Aug-20	176
Total		7855
Mean		101

21-May-21	21-Jul-21	61
26-May-21	19-Oct-21	146
28-May-21	11-Jan-22	228
28-May-21	06-Oct-21	131
02-Jul-21	11-Nov-21	132
09-Jul-21	15-Jul-22	371
14-Jul-21	08-Dec-21	147
29-Jul-21	11-Dec-21	135
19-Aug-21	25-Nov-21	98
23-Aug-21	25-Nov-21	94
25-Aug-21	01-Dec-21	98
06-Sep-21	13-Dec-21	98
06-Sep-21	06-Dec-21	91
13-Sep-21	17-Nov-21	65
05-Oct-21	15-Dec-21	71
05-Oct-21	01-Apr-22	178
05-Oct-21	19-Jan-22	106
12-Oct-21	08-Dec-21	57
13-Oct-21	03-Feb-22	113
13-Oct-21	06-Jan-22	85
02-Nov-21	04-Mar-22	122
16-Dec-21	10-Jun-22	176
10-Jan-22	21-Feb-22	42
17-Jan-22	01-Apr-22	74
25-Jan-22	23-Mar-22	57
27-Jan-22	19-May-22	112
27-Jan-22	17-Mar-22	49
08-Feb-22	07-Apr-22	58
09-Feb-22	21-Apr-22	71
10-Feb-22	09-Jun-22	119
10-Feb-22	23-Mar-22	41
16-Feb-22	07-Apr-22	50
17-Feb-22	10-Jun-22	113
23-Feb-22	05-May-22	71
28-Feb-22	23-Jun-22	115
28-Feb-22	16-Jun-22	108
03-Mar-22	11-May-22	69
07-Mar-22	21-Jun-22	106
29-Mar-22	12-Jul-22	105
04-May-22	21-Jul-22	78
Total		13151
Mean		169