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Satisfaction in Child and Adolescent Mental Health Services: Translating Users' Feedback into

Measurement

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## Abstract

The present research addressed gaps in our current understanding of validity and quality of measurement provided by Patient Reported Experience Measures (PREM). We established the psychometric properties of a freely available Experience of Service Questionnaire (ESQ), based on responses from 7,067 families of patients across 41 UK providers of Child and Adolescent Mental Health Services (CAMHS), using the two-level latent trait modeling. Responses to the ESQ were subject to strong ‘halo’ effects, which were thought to represent the overall positive or negative affect towards one’s treatment. Two strongly related constructs measured by the ESQ were interpreted as specific aspects of global satisfaction, namely Satisfaction with Care, and with Environment. The Care construct was sensitive to differences between less satisfied patients, facilitating individual and service-level problem evaluation. The effects of nesting within service providers were strong, with parental reports being the most reliable source of data for the between-provider comparisons. We provide a scoring protocol for converting the hand-scored ESQ to the model-based population-referenced scores with supplied standard errors, which can be used for benchmarking services as well as individual evaluations.

*Keywords:* patient satisfaction, PREM, halo effects, affective overtones, approximated IRT scores

## Satisfaction in Child and Adolescent Mental Health Services: Translating Users' Feedback into Measurement

Health policy in many countries is increasingly preoccupied with the importance of capturing service users' feedback, and there is a strong emphasis on the need to use patient-reported experience measures (PREMs) as a key source of information in this regard. The use of feedback has been widely encouraged as a way to evaluate outcomes in Child and Adolescent Mental Health Services (CAMHS), where clinical governance reviews target such areas of user experiences as accessibility, humanity and organization of care, environment and outcomes (Department of Health, 2009; Attride-Stirling, 2002). The reason for enquiring about the *whole experience* surrounding patients' treatment, rather than merely focusing on clinical effectiveness and safety, is that even a highly effective service may provide a highly unsatisfactory experience and vice versa.

In a recent influential UK report, Professor Sir Ian Kennedy (2010) suggested that service satisfaction should be the only measure of service quality in child health. A growing body of literature suggests that satisfaction with the care that patients receive is indeed important, and may be as important as clinical effectiveness, because through complex feedback processes one influences the other. While positive outcomes promote satisfaction in a rather obvious way, satisfaction may also promote positive outcomes, for example by keeping the child and the family engaged in treatment. Both child and parental satisfaction is associated with engagement and treatment completion (Stallard, 1995; Shapiro, Welker & Jacobson, 1997); and given that 30%-60% of CAMHS cases terminate treatment prematurely (Kazdin & Mazurick, 1994), promoting satisfaction may be particularly important to reduce dropout rates in CAMHS. Satisfaction may increase involvement of patients in the care that they receive, and greater involvement is associated with positive outcomes (Anderson, Rivera & Kutash, 1998; Edwards

& Elwyn, 2001). In CAMHS in particular, involvement must be ensured not only for the young people themselves but also for their parents/carers, primarily because the parents play a crucial role in deciding whether a child reaches and completes treatment (McNaughton, 1994).

Based on this evidence, there are good reasons for capturing service user feedback. However, there is a long way between collecting feedback and putting it to good use. The intended use of patient feedback in CAMHS includes understanding and solving problems in care delivery, demonstrating accountability to the public and taxpayers, and benchmarking of services (Department of Health, 2009). For all these purposes, adequate interpretation of what patients have said is essential; and any quantified interpretation requires good measurement.

The remainder of this article is organized as follows. First, we discuss likely constructs invoked by PREMs, and general issues and challenges in establishing their construct validity. We point out the limitations of psychometric information available on most PREMs described in the literature, and argue that psychometric modeling of response processes at the item level is essential for building valid metric scales for benchmarking and other diagnostic purposes. Next, we present the Experience of Service Questionnaire (ESQ) – a short satisfaction measure designed specifically for use in child healthcare – which is ideally suited for exploring the raised issues of construct validity and measurement quality. We analyze responses to the ESQ using a large sample of CAMHS patients treated by 41 service providers across the UK, in order to establish measurement models at the individual and the service provider levels, and investigate levels of agreement between parents and children. We also provide a scoring protocol and norm-referenced tables for the ESQ that can be used for individual diagnostics and service benchmarking purposes. We conclude with a discussion of findings and the illuminating interpretation of the factor structure underlying the data.

## Service Users' Feedback and Measurement

### What do Patient-Reported Experience Measures Actually Measure?

PREMs capture individual experiences with very different aspects of service, such as suitability of the environment in which the patients are seen, respect that is shown to them, their involvement in decision making, convenience and accessibility, etc. Considered separately, these aspects may be used as a basis for benchmarking services according to the average level of provision/satisfaction across patients in the service. Taken together, these aspects may form a different kind of measurement; they may measure psychological attributes that drive users' reports, which have a distribution in the population of patients and therefore may be used for scaling of individuals as well as services.

The literature on PREMs is inconsistent in regard to which constructs may be underlying responses to them. Some authors (e.g. Brannan, Sonnichesen, & Heflinger, 1996; Ayton et al., 2007) suggest that PREMs in the context of CAMHS indicate *satisfaction*, while some (e.g. Day, Michelson and Hassan, 2011) imply that they directly measure service *quality* as experienced by the patient. The difference might seem subtle; however, understanding the nature of constructs PREMs might invoke is important for their correct use and interpretation. It has been questioned whether feedback reports constitute the results of an active service evaluation; instead, they seem to be heavily influenced by the patient's '*attitudes and feelings*' (Williams, Coyle & Healy, 1998; emphasis is original), and therefore they are conceptually closer to affective satisfaction.

Interestingly, much research attempts to understand the nature of satisfaction by correlating PREM scores with demographic variables, symptomatology, and other external measures, including self-reported attitudes and other constructs that themselves have unclear structure and validity (e.g. Garland, Saltzman & Aarons, 2000; Barber, Tischler & Healy, 2006). This preoccupation with finding socio-demographic correlates of satisfaction (which is

presumably measured by PREMs) was noted by Locker and Dunt back in 1974, and we agree that the value of such analyses in understanding the nature of satisfaction is limited, and a more direct approach is needed.

Other researchers aim to understand antecedents of satisfaction by asking patients what features constitute a good and a bad service (e.g. Biering & Jensen, 2011; Hart, Saunders & Thomas, 2005). A direct qualitative study has been carried out recently by Biering & Jensen (2011) who found that adolescents perceive that a ‘good’ psychiatric service allows self-expression, sees a person in them as opposed to just patient, provides them with a secure place, ‘tough love’ and discipline, and interaction with peers who have similar problems. Clearly, the adolescents’ satisfaction is likely to develop from service evaluations according to these criteria, rather than areas of service experiences prescribed as important by the health services, or as judged by parents/carers or medical professionals. An important point to make here is that clinical governance or other bodies interested in patient feedback do not necessarily know which aspects of service drive satisfaction for different users. These might overlap with areas covered by an experience measure, or might differ from them entirely. Developers of comprehensive experience measures in CAHMs are well aware of this and try to incorporate criteria important to service users’ satisfaction into their measures (e.g. Ayton et al., 2007; Day et al., 2011). Whether a measure constitutes of these user-specific criteria, or more governance-driven general ones, we would argue that the feeling of overall satisfaction based on their own criteria is likely to influence the users’ reports on **all** service experiences.

To shed more light on constructs underlying responses to PREMs, researchers explore their factorial structures (e.g. Garland et al., 2000; Day et al., 2011; Brannan et al., 1996; Ayton et al., 2007; Shapiro et al., 1997). It must be said that factorial studies cannot reveal factors beyond what has been put in; and accordingly, questionnaires that are more comprehensive will typically yield a larger number of measured constructs than shorter and more general ones. For

instance, Garland, Saltzman and Aarons (2000) constructed a satisfaction measure for adolescents by using themes emerging from qualitative interviews, and then identified “four factors of the scale” (Counselor qualities, Meeting needs, Effectiveness, and Counselor conflict). Other questionnaires developed specifically for CAMHS reveal different factors depending on the content included in them. For instance, Ayton and colleagues (2007) identified seven factors, including Professionals’ skills and behavior, Information, Access, and Relatives’ involvement. Day and colleagues (2011) identified three (Relationship, Privacy, and Session activity); and Shapiro and colleagues (1997) found only two (Relationships with therapist, and Benefits of therapy).

Despite the seemingly different structures underlying these questionnaires, all of them yielded strong correlations between factors. Where reported, these correlations are in range 0.5-0.7; and specific factors can be considered related enough to form a total satisfaction score (e.g. Brannan et al., 1996; Ayton et al., 2007). ‘Validation’ exercises against other established satisfaction measures typically yield strong correlations between all measured scales (e.g. Garland et al., 2000). This evidence points to existence of a general factor that underlies satisfaction with specific aspects of users’ experiences. Whether this factor represents satisfaction, or only satisfaction, remains largely unknown.

### **Importance of Adequate Psychometric Analysis of Responses to PREMs**

Sound psychometric properties are vital for adequate decision making based on responses to questionnaires. In particular, all stakeholders must have a very good idea of the appropriateness and fidelity of measurement, as well as of its precision and sensitivity. Knowing what a PREM really measures is important for care providers who rely on patient feedback to improve quality of care. Ensuring the instrument’s ability to differentiate between a good experience and a bad one is important for health authorities who monitor performance of

services. For children and their families, it is important that the right questions are asked, and that their voices are not only heard but also adequately interpreted.

Two specific issues in patient experience measurement often obscure the true picture of its validity and sensitivity. First, it is widely acknowledged that PREMs often give an overly positive picture of experiences (for an overview, see Williams et al., 1998). Inflated satisfaction scores have been partly attributed to biased sampling (e.g. only most satisfied patients return questionnaires) and partly to ‘social desirability’ effects (Young, Nicholson & Davis, 1995; Brannan et al., 1996). While ‘social desirability’ in its usual meaning refers to presenting self in more positive light, in the context of evaluation of service providers overly positive feedback might be explained by desire to please people the patient is rating, fear of confrontation and similar processes. In their illuminating interviews, Williams, Coyle and Healy (1998) revealed a highly conditioned and contrived process by which patients decide whether to report ‘satisfaction’ or ‘dissatisfaction’, despite being clear on the valence of their experiences. They found that service users were generally inclined to report satisfaction and ‘forgive’ negative care episodes, often driven by their subjective perception of service’s boundaries of duty and culpability. Clearly, reports influenced by such caveats cannot be taken as true reflection of patients’ experiences.

The second problem with measurement provided by PREMs is lack of discriminant validity between different aspects of experiences. As discussed earlier, all constructs within the same measure and across different experience measures tend to be strongly correlated; even conceptually unrelated domains are often found to produce similarly positive or similarly negative ratings. It might be the case that some services get every aspect of care right, and some get them consistently wrong, thus positive correlations of all service aspects could be seen when between-service data is considered. For instance, Brannan and colleagues (1996) report correlation 0.68 between such different aspects of service as ‘Access and Convenience’ and

'Relationship with Therapist' based on data from different services. However, reports from within the same service also yield strong positive correlations between all service aspects (e.g. Garland et al., 2000), which would imply, for example, that families located further away from the service happen to also receive worst appointment times etc. – clearly an unlikely proposition. This phenomenon, named *halo* effects or *affective overtones*, is well known and researched in marketing and brand evaluation. It is defined as overgeneralization of features based on a single important dimension. Holbrook (1983, page 247) suggests that “*this effect may occur ...when overall preferences color belief ratings and thereby obscure the underlying role of perceptions as bases for ... evaluation*”. Direct evidence of this exact process taking place in service evaluation comes from the work of Williams and colleagues (1998) who found that experiences with services expressed by patients during in-depth interviews were overwhelmingly “couched in positive or negative terms”. Ignoring this factor in feedback reports may lead to false conclusions about their construct validity.

Patient-reported experience measures suitable for use in CAMHS for which some psychometric information is available include self-completion questionnaires and structured interview schedules, ranging in length from four to over one hundred questions. Unfortunately, recent studies on the psychometric properties of patient-reported experience measures in CAMHS that we have reviewed (Brannan et al., 1996; Attkisson & Greenfield, 1996; Shapiro et al., 1997; Garland et al., 2000; Ayton et al., 2007; Day et al., 2011) do not address the questions of construct validity and measurement precision fully, nor do they deal with the above mentioned challenges. In particular, the cited studies use Cronbach's alpha as evidence of internal consistency (i.e. unidimensionality) and as the estimate of test's reliability. Recent psychometric work conclusively shows that alpha is not related to the internal structure of the test, nor is it a good measure of the accuracy of individuals' test score (e.g. Sijtsma, 2009). Factor analysis, which is a good basis for investigations of the test's structure and establishing the precision of

measurement, was conducted in some of the studies; however, the item responses in such analyses were treated as they were continuous variables. Because responses to items are in fact arranged in categories, relationships between the item scores and the factor scores are not linear, and Item Response Theory (IRT) techniques would be more appropriate for modeling questionnaires' factorial structures (Reise & Waller, 2009). To our knowledge, no existing CAMHS-specific experience measure employs IRT-based scoring methods, or provides information on measurement precision for each score, which are essential for service performance decisions and assessments of change (Reise & Haviland, 2005).

Moreover, the reviewed studies are based on too few patients (typically just over 100; e.g. Ayton et al., 2007; Day et al., 2011) from a few closely located service providers. While such samples are too small for analyses of factor structures, and certainly are inadequate for benchmarking purposes, the main problem is that research findings might not be generalizable across other service providers. A notable exception is the study by Brannan and colleagues (1996), which recruited over 500 patients across several geographical regions in the US. However, this study did not explore effects of nesting patients within services to identify any service-level processes affecting users' experiences.

### **Objectives of the Present Study**

Given current lack of quality information on psychometric properties of existing experience measures used in CAMHS, the last thing needed in this situation is developing yet another measure. Instead, we believe that **any** existing measure could be made more useful to psychiatric services and enable better decision making in clinical governance if the following information was provided: 1) a clear statement of construct(s) measured; 2) a scoring protocol together with the assessment of the scores precision; and 3) benchmarking data. In dealing with questionnaire responses that are categorized, nested within service providers, and are subject to

systematic ‘halo’ biases, we argue that using up-to-date techniques that take all these issues to account is paramount.

The instrument we are looking to improve by supplying detailed psychometric information is the Experience of Service Questionnaire (ESQ), a short, free-to-use general feedback tool developed for use across child healthcare (Attride-Stirling, 2002). The measure has been adopted as the core measure for service experience across many CAHMS providers in the UK. The most recent England-wide CAMHS mapping exercise (Barnes, Devanney, Uglebjerg, Wistow & Hartley, 2010) reported the questionnaire’s use with parents by 19% of services, and with children by 21% of services in 2008 – a steady increase compared to the previous years.

Despite the widespread adoption of the ESQ, to our knowledge only one study has explored its properties based on real patient data. Barber, Tischler and Healy (2006) focused on relationships between young persons’ symptoms (‘caseness’) and satisfaction, and to this end the researchers employed the prescribed ESQ sum score. In addition, they looked at the parent-child agreement aspect by aspect (i.e. item by item). This research offered a first insight into between-rater agreement and item endorsement levels (both reported to be high); however, the findings are limited by a small sample size (73 parents and 45 children) confined to one clinic. The study did not examine the internal structure of ESQ or its reliability; instead, it assumed that the questionnaire is a valid and reliable measure of satisfaction.

We do not attempt to promote the ESQ beyond other questionnaires or suggest its better coverage or comprehensiveness. Instead, the aim is to enable better decision making using a popular generic questionnaire by applying modern psychometric science to a large sample of patients across a range of UK CAMHS providers. Attride-Stirling (2002) identified the key weaknesses in the ESQ development project as the lack of thorough validation, the absence of evidence for its psychometric properties, and the absence of national benchmarks. In this paper, we aim to answer all these shortcomings, as follows. First, we look to establish latent constructs

that affect individual reports by modeling item responses. Second, we assess effects of nesting within providers to identify service-related factors of users' experiences. Finally, we suggest a scoring protocol taking to account both the individual and the service-level effects, and assess measurement precision and sensitivity of these suggested scales.

## Methods

### The Experience of Service Questionnaire

The ESQ was developed by the Commission for Health Improvement – a body charged with service improvement of health services across England, which has since been reconfigured into the Care Quality Commission. The measure was developed from focus groups with children and parents across the child health sector, identifying elements that were important for their positive experience of care (Attride-Stirling, 2002). It was intended for use with children and young people over the age of nine and with the parents/carers of younger children. It was piloted with CAMHS attendees with qualitative feedback leading to final amendments.

The ESQ comes in three versions: the parent/carer, the child version for children aged 9-11, and the young person version for children aged 12-18. All ESQ questionnaire versions are given in the Appendix. It can be seen that the 12 items cover the same content in all versions, in the same order. However, there are differences between the three versions in the way the questions are phrased, and in response format and options used. In the child versions, the questions are asked about the patients' own experiences: whether the child felt that *he/she* was listened to, or *his/her* problems were addressed. In the parent version the questions still relate to '*my child*', but it is the parent who is the focus of this experience – questions are asked about whether the parent felt that *he/she* was listened to, or *his/her* problems were addressed. Furthermore, there are differences in phrasing between the two child versions of the questionnaire. While the young persons' version uses affirmative statements and the same rating

options as the parent version ('not true' – 'partly true' – 'certainly true'), the version for younger children asks direct questions and uses response options that vary for each individual question.

## **Participants**

Responses to the ESQ were obtained from the CAMHS Outcomes Research Consortium (CORC; [www.corc.uk.net](http://www.corc.uk.net)) – a learning collaboration of the majority of CAMH services across the UK and Scandinavia who have joined to determine best ways to use patient reported outcomes and experience data to improve service quality. Forty-one CORC members have been collecting experience data using the ESQ; these were located in London, Midlands, East of England, North of England, South East and South West of England; and Scotland.

Either parent/carer, or child, or both ESQ forms were available for 7,067 patients (55.1% were boys), ranging from 11 to 757 patients per service (mean 172.4, median 82). The children's ages at referral ranged from 1 to 18 years, mean 11.2 (SD=3.6). The full age distribution, children's ethnic background and recorded presenting problems are shown in Table 1. The mean parent-reported total difficulty score on the Strength and Difficulties Questionnaire (SDQ; Goodman, 2001) for these young people was 18.8 (SD=7.2), which is equivalent to the 94<sup>th</sup> centile of British national norms and above the generally accepted clinical cut point of 17 (SDQ: Normative SDQ data from Britain, 2001). Overall, the demographic composition of the present sample and the degree of experienced problems is very similar to that reported for all CORC members (the full report is available from [www.corc.uk.net](http://www.corc.uk.net)), which suggests that the families returning feedback to the ESQ are broadly representative of all families who attend CORC member services.

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Insert Table 1 about here

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## Analyses

The focus of our investigation was on unobserved constructs, which are not measured perfectly but merely indicated by responses to questionnaire items. With only three ordered rating categories used in the ESQ, it was important to treat the item data as *ordinal*, using item response theory (IRT) approaches. Another important feature of our data was that individual responses were not sampled independently; rather, they were *nested* within CAMHS providers. Because the questionnaire focused on the care provider, this nesting was expected to produce substantial dependence among responses from the same provider. Based on the above considerations, methodology adopted for this study is *two-level latent trait modeling*, a synthesis of multilevel and latent trait modeling (Rabe-Hesketh, Skrondal & Pickles, 2004). All analyses were performed using *Mplus* version 6 (Muthén & Muthén, 1998-2010), using the unweighted least square estimator with robust standard errors (denoted ULSMV in *Mplus*).

Because all three versions of ESQ differ in the way items and/or response categories are phrased, they were analyzed separately. The strategy adopted for analyses was as follows. First, the extent to which nesting of patients in services produced dependencies between their responses was examined. To quantify the proportion of the total variance due to differences between the providers, the intraclass correlations were computed. In conjunction with the reported average cluster size, the intraclass correlation provides an indication of the importance of the nesting effects (i.e. whether the nesting effects need to be taken into account). When the design effect size, which is computed simply as  $1 + (\text{average cluster size} - 1) * \text{intraclass correlation}$ , is greater than 2, the nesting effect is important and must be taken to account in analyses (Muthén & Satorra, 1995). Next, two-level exploratory factor analyses (EFA) were carried out. At the **individual level**, we were looking for factors explaining common variance in item responses. The Graded Response model for ordered categories (Samejima, 1969) was used

to link the item responses to the common factors. At the **service provider level**, exploratory analyses were aiming to explain common variance in service-specific item intercepts (Hox, 2010). Following the EFA, alternative factor models for each level were compared to each other in confirmatory fashion in terms of their goodness of fit and parsimony, to establish a response model for each of the ESQ informant versions. For each tested model, we report the residuals between the model-estimated and the actual item correlations, the chi-square statistic, the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Standardized Root Mean Square Residual (SRMR). However, due to the lack of established criteria for a well-fitting multilevel model, and the small sample size at the provider level (N=41), we relied on the assessment of residuals and residual-based index (SRMR) in order to judge the models' appropriateness for the data. Finally, the best within-level and between-level solutions were suggested for each ESQ informant version. As additional construct validity evidence, responses from families where both parents and children completed the ESQ were analyzed jointly to assess agreement between the informants.

Based on the established measurement models, we computed expected a posteriori (EAP) factor scores for respondents (Thissen & Orlando, 2001), together with their standard errors. To enable researchers and practitioners easily access these model-based scores without carrying out the two-level IRT estimation, we computed approximated EAP scores for each possible summed score (see Thissen & Orlando, 2001) by taking the mean of the likelihood function of all response patterns leading to this summed score.

## **Findings**

### **Item Endorsement and Response Rates**

Distributions of responses to all ESQ items were highly skewed, with vast majority of responses falling within the category 'certainly true', which represents most favorable ratings.

For most questions, approximately 70-80% of all informants chose the top category. Overall, question 3 ('treated well') showed the highest endorsement (92% of parents/carers chose the top category). The least endorsed questions, particularly by children, were those concerning facilities (only around 56% of younger children were satisfied with these arrangements) and appointment times (only around 55% of all children were satisfied). Overall, the older children were least satisfied and parents were most satisfied with all experiences.

To check whether the high positive ratings could be attributed to biased sampling (i.e. only most satisfied patients returned questionnaires), we compared the ESQ response rates to improvement in symptoms. A one-item rating of 'problem improvement' from the follow-up version of SDQ is typically collected at about the same time as the ESQ is given, and distinguishes between five levels of perceived improvement in patient's mental wellbeing (from 'much worse' to 'much better'). The improvement rating was available for a much wider sample (N=13,494) than the present ESQ sample. If it was true that only most satisfied patients returned the service feedback questionnaires, the response rates to the ESQ should increase with the increase of the self-rated improvement in symptoms. As Figure 1 shows, the opposite was true – response rates to ESQ for both parents and children dropped slightly with improved symptoms.

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Insert Figure 1 about here

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## **Constructs Measured by ESQ**

### **Constructs Measured by the Parent/Carer Version**

Parents/carers returned 6,062 questionnaires (across all 41 services, mean 147.9 per service). Item intraclass correlations presented in Table 2 ranged from 0.06 (item 9, "convenient

appointment times”) to 0.15 (item 3, “treated well”), yielding the design effect sizes above 9, and indicating substantial nesting effects on the parents’ responses to all items.

The two-level EFA suggested presence of a strong first factor and one further factor at both the individual level (first three eigenvalues 8.0, 1.3 and 0.6) and the provider level (eigenvalues 10.1, 1.2 and 0.4). **At the individual-level**, an oblique rotation of two factors yielded a nearly ideal independent clusters structure. The first factor was indicated by nine items: 1, 2, 3, 4, 5, 6, 7, 11 and 12. These items refer to aspects of health *Care* such as experiences of interactions with the clinician(s) including communication (“people who have seen my child listened to me”), competence (“people here know how to help”) and consistency of care (“people here are working together”). The second factor was indicated by items 8, 9 and 10, which relate to *Environment* surrounding the treatment, such as appointment times, facilities and location. Item 3 (“treated well”) had a non-trivial cross-loading on this factor, suggesting that for parents being treated well meant receiving good customer service in general as well as good medical help. **At the provider level**, two correlated factors were indicated by the same items as at the individual level, except that there was no cross loading for item 3.

CFA confirmed that the two-level model depicted in Figure 2, with two correlated factors at each level fitted the data well ( $\chi^2 = 156$ ,  $df = 105$ ,  $p = 0.001$ ; RMSEA = 0.009; CFI = 0.991; SRMR<sub>w</sub> = 0.034; SRMR<sub>b</sub> = 0.044). This model reproduced the item correlations well (the largest individual-level and provider-level residuals were 0.08 and 0.09 respectively). Table 2 provides the standardized individual-level factor loadings for this model. The two factors correlated moderately at the individual level ( $r_{12} = 0.62$ ), and the correlation was strong at the provider level ( $r_{12} = 0.76$ ). Simpler models, with one factor explaining the item co-variances at either individual ( $\chi^2 = 298$ ,  $df = 107$ ,  $p < 0.001$ ; RMSEA = 0.017; CFI = 0.968; SRMR<sub>w</sub> = 0.061; SRMR<sub>b</sub> = 0.044) or provider levels ( $\chi^2 = 158$ ,  $df = 106$ ,  $p = 0.001$ ; RMSEA = 0.009; CFI = 0.991; SRMR<sub>w</sub> =

0.034;  $SRMR_b = 0.071$ )<sup>1</sup>, failed to reproduce correlations between items 8, 9 and 10 (residuals up to 0.27 for the individual level, and up to 0.39 for the provider level).

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 Insert Figure 2 and Table 2 about here  
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### **Constructs Measured by the Young Person (12-18) Version**

The young person's version was completed by 3,114 adolescents (across 40 services, mean 77.9 per service). Item intraclass correlations (presented in Table 2) were lower than those observed for parents' responses, ranging from 0.03 (for items 8, 9, 10 and 11) to 0.10 (item 3, "treated well"). Nevertheless, taking to account the average cluster size, the design effect sizes were above 3 for all items, indicating that the provider-related effects were substantial and needed to be taken to account.

The two-level EFA suggested presence of a strong first factor and one further factor at both the individual level (eigenvalues 7.2, 1.2 and 0.7) and the provider level (eigenvalues 9.6, 1.1 and 0.7). **At the individual-level**, an oblique rotation resulted in a nearly ideal independent clusters structure, with the first factor indicated by items 1, 2, 3, 4, 5, 6, 7, 11 and 12; and the second by items 8, 9 and 10. Item 8 ("comfortable facilities") had a small cross-loading on the Care-related factor. This structure was very similar to the parent version in all but cross-loading items. **At the provider level**, two correlated factors were indicated by the same items as at the individual level, with no cross-loadings.

CFA for the two-level model depicted in Figure 2, with two factors at each level, fitted the data reasonably well ( $\chi^2 = 337$ ,  $df = 105$ ,  $p < 0.001$ ;  $RMSEA = 0.027$ ;  $CFI = 0.982$ ;  $SRMR_w = 0.034$ ;  $SRMR_b = 0.072$ ). This model reproduced the correlations between the items well at the

<sup>1</sup> Due to the small sample size at the provider level (N=41), change in chi-square based indices is not significant between models with different number of factors at the provider level. Residuals for correlations and SRMR are better indicators of relative model fit in this case.

individual level (the largest residual was 0.08) and somewhat poorer at the provider level (residuals up to 0.19). Table 2 provides the standardized factor loadings for this model. The two factors correlated moderately at the individual level ( $r_{12} = 0.61$ ), and much stronger at the provider level ( $r_{12} = 0.85$ ). A simpler model with one factor explaining the item co-variances at the individual level ( $\chi^2 = 638$ ,  $df = 107$ ,  $p < 0.001$ ; RMSEA = 0.040; CFI = 0.958; SRMR<sub>w</sub> = 0.050; SRMR<sub>b</sub> = 0.072) failed to reproduce correlations between items 8, 9 and 10 (residuals up to 0.25). The one-factor model for the provider level ( $\chi^2 = 339$ ,  $df = 106$ ,  $p < 0.001$ ; RMSEA = 0.027; CFI = 0.982; SRMR<sub>w</sub> = 0.034; SRMR<sub>b</sub> = 0.077) also showed diminished residuals for correlations between items 8, 9 and 10 (up to 0.27) in comparison to the two-factor model.

### **Constructs Measured by the Child (9-11) Version**

The child version of ESQ was completed by 966 children (across 36 services, mean 26.8 per service). Item intraclass correlations (presented in Table 2) were lower than those observed for parents' responses, ranging from 0 (for item 2, "easy to talk to") to 0.11 (item 3, "treated well", and item 12 "good help overall"). The ability of younger children to pick up on some provider-related effects was clearly weaker than that of their parents. Even with the smaller average cluster size, the design effect sizes were above 2 for all but two items (item 2 and item 8), indicating that the provider-related effects were still important to account for in analyses.

However, too few responses were available for younger children to carry out full two-level analyses, particularly comparing factor structures in confirmatory fashion. Therefore, we limited our investigation to the two-level EFA with no imposed structure (unrestricted covariances) at the provider level, in order to establish a tentative structure underlying the individual item responses. The two-level EFA extracted two factors for **the individual level** (eigenvalues 7.0, 1.0 and 0.7), with the first factor indicated by seven items: 1, 4, 5, 6, 7, 11 and 12; and the second by five items 2, 3, 8, 9 and 10. This solution is similar to that for the parents,

with some noteworthy differences. While items 2 (“easy to talk to”) and 3 (“treated well”) did load on the Care-related factor, they loaded more saliently on the Environment factor, indicating that the younger children attributed these aspects of service to the general environment surrounding their treatment. The two-factor model with two cross-loadings reproduced the item correlations reasonably well (maximum residual 0.10). The correlation between the two factors was strong ( $r_{12} = 0.77$ ), indicating that the young children differentiated between aspects of Care and Environment less than parents or adolescents.

### **Parent versus Child Perspectives**

Relationships between the parent and child perspectives were examined by jointly analyzing responses from the same family, modeling correlated ‘parent’ and ‘child’ latent constructs for both Care and Environment at the individual level, with no structure imposed at the provider level. For older children (N = 1,509 families), ‘Satisfaction with Care’ correlated at  $r = 0.74$  with the respective view of their parents; and for younger children and their parents (N = 471 families) this correlation was stronger ( $r = 0.80$ ). Older children’s perspective on ‘Satisfaction with Environment’ correlated at  $r = 0.80$  with the respective view of their parents; and the correlation was again higher ( $r = 0.89$ ) for younger children. Although strong, these correlations are by no means perfect (recall that these *latent* relationships are not attenuated by the measurement error), indicating that nuances around personal experiences leave plenty of room for distinct perspective on aspects of treatment as perceived by the child and the parent.

### **Measurement Provided by the ESQ**

#### **IRT Estimation and Precision of Factor Scores**

After the two-level models depicted in Figure 2 have been estimated, informant scores for the Care and Environment constructs can be estimated, for instance, using the expected a

posteriori approach (EAP; Thissen & Orlando, 2001). This Bayesian method makes use of the known population distribution of the latent trait (assumed standard normal) to estimate the expected trait value given the observed response pattern. The service-level scores can be also estimated from continuous service-level item intercepts, for instance by the regression method.

Standard errors computed for the EAP-estimated individual-level 'Care' scores revealed that the scale discriminated well between patients with *low to average* scores, but lacks ability to differentiate between higher scores. Thus, the standard errors for the 'Care' scale are below 0.5 (translating into reliability of above 0.75) for the scores below 0 in the Parent version, and for the scores below 0.25 in the Young Person version. Conversely, measurement precision is unacceptably low (SE is above 0.6) for all levels of the 'Environment' construct, which is measured by only three items. Unfortunately, these levels of precision are insufficient for any practical measurement purposes at the individual level.

### **Approximation of the IRT Scores Using Summed Scores**

While the IRT-based estimation is the most accurate for producing individual scores, it requires specialist software and expert knowledge, and is not a realistic option in the psychiatric practice settings. However, conventional summed score can be used to approximate the IRT score, by taking the mean of the likelihood function of all response patterns leading to this summed score (see Thissen & Orlando, 2001). Table 3 provides such conversion from the summed ESQ 'Care' scores to their respective IRT scores, and corresponding standard errors. This conversion provides an instant reference point (norm) because the IRT score is scaled like the familiar z-score. The standard error associated with each score can be used to assess significance of differences between satisfaction levels of individual patients, and for aggregation at the service level.

To use the conversion table, the least favorable rating (e.g. “not true”) must be given the lowest code (0), and the most favorable rating (e.g. “certainly true”) must be given the highest code (2). Coded in this fashion, item responses must be added to produce the sum score ranging from 0 to 18, and then the approximated IRT score and its standard error can be easily found for each sum score.

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Insert Table 3 about here

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### **Discussion**

The present paper addressed the key weaknesses in our current understanding of psychometric functioning of patient reported experience measures, namely: the lack of evidence for their construct validity, for their measurement precision, and the absence of national benchmarks. To this end, we explored the Experience of Service Questionnaire, a short, freely available general feedback tool, using responses from children and parents who had attended 41 CAMHS providers across the UK.

First, we established latent constructs that affect individual reports by modeling item responses taking to account nesting of individuals within services. For all ESQ versions, each item response was underlain by one of the two moderately to strongly correlated factors, related to either Care or Environment. Only one item in the parent version (item 3, “treated well”) and one item in the young person version (item 8, “comfortable facilities”) loaded on both factors. This rather well behaved independent clusters structure, however, provided several clues for understanding the real nature of constructs invoked in responding to the ESQ. The first clue was that the items referring to largely incidental and possibly fluctuating arrangements (i.e. appointment times, facilities and location) related to each other so strongly as to form a factor. The second was that these environmental aspects also correlated substantially with care-related

aspects represented by the rest of the items. The fact that even conceptually independent items shared common variance suggested that ESQ responses were subject to a strong ‘halo’ effect.

While many researchers over years have considered the ‘halo’ effect to be a rating bias and a problem to the quality of data, others noted the useful variance captured by the respondents’ affect (Murphy, Jako & Anhalt, 1993). It is our view that the ‘halo’ observed in the present study certainly captures valid variance directly related to patient *satisfaction*. The overall feeling of satisfaction/dissatisfaction influences **all** reported experiences, making reports about very diverse experiences similar, and responses to questionnaire items highly correlated. To illustrate a possible mechanism for this process, we constructed an alternative structural model for the ESQ – with one factor representing the overall satisfaction influencing responses to all items (which results in the strong ‘halo’ effect observed), and the other capturing the remaining shared variance in nine items concerned with care-related experiences only. This alternative solution could in fact be easily obtained by EFA with the target rotation according to this hypothetical model (Browne, 2001), rather than relying on software-driven oblique rotations<sup>2</sup>. This alternative rotation inevitably showed the same fit to the data as our adopted two-factor solution; however, it provided an important insight into constructs underlying the responses. It clearly links to previous findings and our earlier suggestions that responses to service feedback questionnaires are underlain by a common factor, which we interpret as satisfaction. In the ESQ data, this factor accounts for approximately half of the variance in item responses.

For the above reasons, we suggest that the ESQ should be treated as a **subjective measure of satisfaction**, not as an objective report of the quality of care patients received or the quality of environment surrounding their treatment. Hence, the two correlated factors resulting

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<sup>2</sup> Most EFA rotation methods would minimize the number of factors each item loads on – i.e. rotate to an independent clusters structure.

from the independent clusters solution represented related aspects of patients' satisfaction and we shall finally label them '*Satisfaction with Care*' and '*Satisfaction with Environment*'.

The 'Satisfaction with Care' scores had good precision, differentiating well at the lower levels of satisfaction in particular. This is a desirable property for a PREM because the measurement focus is typically on individual problems and issues. In addition, as Williams and colleagues (1998, page 1359) point out, over-reporting is common and therefore 'dissatisfaction' rather than 'satisfaction' scores may be more useful "*as an indication of a minimum level of negative experience*" and "*in benchmarking exercises*". The ESQ measure was not sensitive to individual differences at the positive end, however, in most cases multiple feedback questionnaires will ensure reliable distinctions between highly performing services, as well as between underperforming ones. The 'Satisfaction with Environment' construct with its three items of widely varying content was lacking the measurement precision and therefore its use is not recommended. However, we envisage that the three environment-related items can be useful in monitoring satisfaction with specific aspects of environment between services.

Based on responses to individual items, high levels of satisfaction with services in general were found, with children being satisfied slightly less than parents. This is in line with another UK study on satisfaction in CAMHS (Barber et al., 2006). Despite slightly different phrasing of items and rating options being used, there were strong similarities between the young patients and their parents, both in terms of the overall agreement on the given ratings, and in terms of meaning of the two constructs. However, the children's responses were less reliable and produced less defined factors and a greater dependence between them. In addition, children were less able to notice provider-related features. This may reflect their relative cognitive immaturity and should have implications for the weight given to the young patients views in any comparisons between CAMHS providers. On the other hand, the strong nesting effect observed

in parental ratings is the best evidence of utility of the ESQ as a service feedback tool. Based on these results, we recommend using parental ratings to benchmark services.

### **Limitations**

While the present analyses were based on a large sample of parents and children from 41 services across the UK, it is possible that the sample is biased in ways yet unknown. The voluntary nature of CORC and effort required to collect and submit data may mean that those services who encourage patients to complete the measure feel most confident about the quality of service they provide, and our data overestimated levels of satisfaction with CAMHS across the UK. To eliminate the possibility of such positive-report bias, purposeful randomized data collection should be employed across not yet included services, and indeed in other countries.

Another limitation is the lack of external validation data, particularly at the provider level. No externally rated provider-level quality or outcome measures are available at present time in the CORC dataset; however, exploring the relationships between those and patient satisfaction is certainly an essential aspect of future research.

### **Conclusions**

The present study presents an important step forward in understanding the construct validity and quality of measurement provided by PREMs in general, and in establishing the psychometric credentials of the ESQ, a freely available patient-reported experience measure in particular. We illustrated our arguments to support the view that responses to PREMs are universally underlain by a general attribute of satisfaction, which we operationalize as affective overall opinion on the quality of service the patient received. Based on this view, we suggested that the ESQ measures two related aspects of satisfaction – Satisfaction with Care, and with Environment.

The measure's robust psychometric properties in assessing Satisfaction with Care suggest that it has the potential to be a powerful service evaluation tool. We provide easy conversion of hand-scored ratings into population-referenced IRT scores, enabling instant advantages of the IRT methodology such as accurate model-based measurement and standard error estimates conditional on the trait level. At the individual level, the ESQ is sensitive to differences in ratings from less satisfied patients, potentially facilitating meaningful problem diagnostics. At the provider level, the ESQ can be used for benchmarking services based on either individual items or the suggested Satisfaction with Care construct.

Based on the measure's performance in multi-level analysis it is recommended that parental reports are the preferred source of data for between-service comparisons. Further work is needed to explore the psychometric properties of this measure in randomly selected service providers and against provider-level measures of service quality.

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## Appendix

### ESQ for parents/carers

Response options: *Certainly True – Partly True – Not True – Don't know*  
 (“don't know” response option is not scored).

1. I feel that the people who have seen my child listened to me
2. It was easy to talk to the people who have seen my child
3. I was treated well by the people who have seen my child
4. My views and worries were taken seriously
5. I feel the people here know how to help with the problem I came for
6. I have been given enough explanation about the help available here
7. I feel that the people who have seen my child are working together to help with the problem(s)
8. The facilities here are comfortable (e.g. waiting area)
9. The appointments are usually at a convenient time (e.g. don't interfere with work, school)
10. It is quite easy to get to the place where the appointments are
11. If a friend needed similar help, I would recommend that he or she come here
12. Overall, the help I have received here is good

### ESQ for young people aged 12-18

Response options: *Certainly True – Partly True – Not True – Don't know*  
 (“don't know” response option is not scored).

1. I feel that the people who saw me listened to me
2. It was easy to talk to the people who saw me
3. I was treated well by the people who saw me
4. My views and worries were taken seriously
5. I feel the people here know how to help me
6. I have been given enough explanation about the help available here
7. I feel that the people who have seen me are working together to help me
8. The facilities here are comfortable (e.g. waiting area)
9. My appointments are usually at a convenient time (e.g. don't interfere with school, clubs, college, work)
10. It is quite easy to get to the place where I have my appointments
11. If a friend needed this sort of help, I would suggest to them to come here
12. Overall, the help I have received here is good

### ESQ for children aged 9-11

Response options vary and are given with each question (“don't know” response option is not scored).

1. Did the people who saw you listen to you? (*Yes-Only a little-Not really-Don't Know*)
2. Was it easy to talk to the people who saw you? (*Yes-Only a little-Not really-Don't Know*)
3. How were you treated by the people who saw you? (*Very well-Ok-Not very well-Don't Know*)
4. Were your views and worries taken seriously? (*Yes-Only a little-Not really-Don't Know*)
5. Do you feel that the people here know how to help you? (*Yes-A little-Not really-Don't Know*)
6. Were you given enough explanation about the help available here? (*Yes-Only a little-Not really-Don't Know*)
7. Do you feel that the people here are working together to help you? (*Yes-Only a little-Not really-Don't Know*)
8. The facilities here (like the waiting area) are... (*Comfortable-Ok-Uncomfortable-Don't Know*)
9. The time of my appointments was... (*Convenient-Ok-Not convenient-Don't Know*)
10. The place where I had my appointments was... (*Easy to get to-Ok to get to-Hard to get to-Don't Know*)
11. If a friend needed this sort of help, do you think they should come here? (*Yes-Maybe-Not really-Don't Know*)
12. Has the help you got here been good? (*Yes-Only a little-Not really-Don't Know*)

Table 1

*Demographics of patients for whom the ESQ data was available*

Age	%	Ethnic origin*	%	Presenting problem**	%
<3	0.3	White	77.7	Emotional problems	50.8
3-4	3.1	Black or Black British	3.5	Other problems	21.7
5-6	7.8	Asian or Asian British	2.9	Conduct	13.3
7-8	13.5	Mixed: White and Black	2.7	Hyperkinetic	10.6
9-10	17.2	Mixed: White and Asian	0.8	Autistic spectrum	8.6
11-12	16.6	Mixed: any other	1.9	Learning Disability	4.6
13-14	19.4	Chinese	0.2	Deliberate self-harm	4.6
15-16	17.7	Any other	1.7	Eating disorder	4.4
17-18	4.4	Not stated	8.6	Habit	4.2
				Developmental	3.9
				Psychosis	1.7
				Substance	1.4

*Note:* \* Data on ethnic origin was available for N=4938 patients. \*\*Data on presenting problems was available for N=2622 patients; sum of percentages for presenting problems is greater than 100 due to comorbidity.

Table 2

*Intraclass correlations for the ESQ versions (based on nesting within 41 services), and standardized factor loadings for the individual level models depicted in Figure 2*

items	Parent/carer			Young person (12-18)			Child (9-11)
	Intraclass correl.	Factor loadings		Intraclass correl.	Factor loadings		Intraclass correl.
		Care	Environ.		Care	Environ.	
1	.10	.90		.08	.85		.09
2	.12	.87		.05	.75		.00
3	.15	.75	.24	.10	.83		.11
4	.11	.93		.04	.86		.05
5	.10	.89		.05	.83		.06
6	.12	.83		.04	.76		.06
7	.12	.90		.06	.86		.05
8	.08		.69	.03	.30	.35	.03
9	.06		.64	.03		.67	.08
10	.07		.63	.03		.64	.06
11	.08	.91		.03	.81		.09
12	.13	.95		.08	.94		.11

Table 3

*Conversion tables from the 'Satisfaction with Care' summed scores to estimated IRT scores, with standard errors and observed proportions in the sample*

Sum score	Parent/Carer			Young person (12-18)		
	IRT score	SE	Proportion	IRT score	SE	Proportion
0	-3.10	.40	.001	-2.97	.41	.002
1	-2.74	.30	.003	-2.63	.34	.003
2	-2.51	.26	.003	-2.39	.30	.004
3	-2.34	.23	.004	-2.21	.28	.006
4	-2.19	.21	.005	-2.04	.26	.007
5	-2.07	.20	.005	-1.89	.25	.009
6	-1.94	.19	.006	-1.74	.25	.011
7	-1.83	.19	.008	-1.60	.25	.014
8	-1.71	.20	.010	-1.46	.25	.018
9	-1.60	.20	.012	-1.33	.25	.022
10	-1.49	.20	.015	-1.19	.25	.027
11	-1.38	.20	.018	-1.05	.25	.032
12	-1.26	.20	.021	-0.91	.26	.037
13	-1.13	.21	.025	-0.75	.27	.045
14	-0.99	.22	.032	-0.57	.29	.055
15	-0.82	.25	.044	-0.37	.32	.073
16	-0.59	.32	.069	-0.11	.38	.104
17	-0.26	.41	.134	0.23	.46	.166
18	0.61	.71	.586	0.90	.66	.365

*Notes:* The 'Satisfaction with Care' summed score is the sum of items 1, 2, 3, 4, 5, 6, 7, 11 and 12. Responses 'certainly true'-'partly true'-'not true' are coded 2-1-0 respectively.

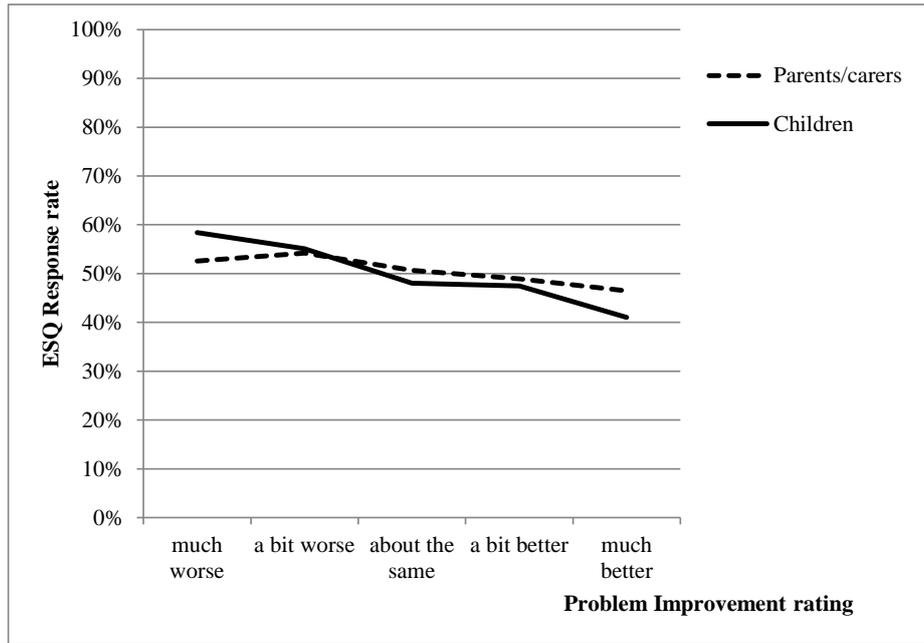


Figure 1. ESQ response rates in relation to SDQ Problem Improvement ratings

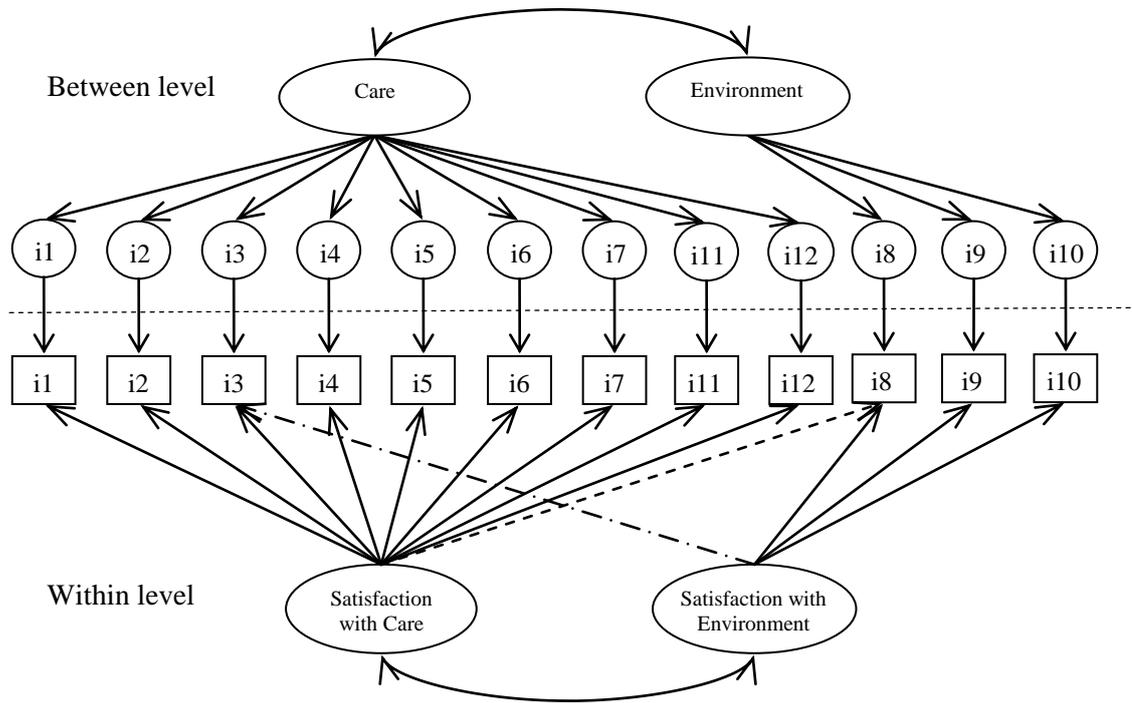


Figure 2. Individual and service-level measurement models for the ESQ

Notes: Cross loading for item 3 marked in dashed and dotted line is significant for parental data only; cross loading for item 8 marked in dashed line is significant for the young persons' data only.