The Generic Lifestyle Assessment Questionnaire
LAQ-G

Chapter 7
Additional validation study

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Following development of the LAQ-G, Forsyth et al (2007) included the questionnaire as a measure of participation in a study of 600 applicants to the Family Fund. Participants completed the LAQ-G, and additional measures of impairment (the Health Utilities Index) and of environmental factors (the European Child Environment Questionnaire). The study showed that the participation of young severely disabled children is affected to similar extents by levels of intrinsic impairment and by environmental factors. Studies using the LAQ-CP have also shown that only some aspects of participation can be explained by levels of impairment, and there is significant variation attributable to environmental factors and barriers such as attitudes of strangers and staff in public places, and lack of suitable transport (Morris et al 2006; Welsh et al 2006). These studies illustrate the possibility of using the LAQ to measure the impact of environmental interventions such as the introduction of new support services.

For research purposes, there is advantage in having fewer than six separate scores to represent an outcome. Mackie et al (2002) used multidimensional scaling to derive the six domains of the LAQ-CP and then used weighting of the separate domains in deriving a total impact score. The weightings were created from judgements made by paediatricians and parents of representative video-recordings of children with cerebral palsy. Forsyth et al (2007) generated a single score for the LAQ-G in order to examine the relationship of participation to level of impairment and to environmental factors. A principal components analysis was conducted with the six domain scores and the first component, accounting for 44% of the variance, was used as the single score. However this process loses much of the richness of the questionnaire data. Forsyth et al (2007) comment that to search for a unidimensional measure of participation may be naïve in light of the obvious complexity of a construct such as 'social participation'.

Further analysis
Validation.
The dataset analysed by Forsyth et al (2007) of 600 children with disabilities, whose families were applicants to the Family Fund, offered the opportunity to examine differences in LAQ-G scores across conditions, age, and socio-economic status. Thirteen categories of disabling condition are recorded by the Family Fund. Thus, hypotheses could be tested about differences in expected profiles of scores between conditions in order to add to the established validity of the measure.

The measure of socio-economic status used was the Townsend Index of Deprivation, (Townsend, Phillimore, & Beattie, 1988). Individual household postcodes were matched to indices obtained from standardised norms for England using the 2001

census. The norms are based on: unemployed residents over 16, as a percentage of all economically active residents aged over 16; proportion of households in the area with 1 person per room and over; proportion of households with no car; proportion of households not owning their own home. For analysis, the groups were divided into those with deprivation indices above and below average (> 0.0 <).

Simplification.
The dataset also allowed further exploration of whether the current six domain scores can be simplified to one or two. The original paper on LAQ-G reported the use of multidimensional scaling on 95 returned questionnaires to examine the psychometric properties of the measure, and to propose the six domains. Analysis using categorical principal components analysis to explore the structure of the responses within the large dataset is described below.

Sample Characteristics
Families applying for the first time to the Family Fund were invited to join the study, having been given written information that funding decisions were entirely separate, and that assessors of applications would not know whether a family had participated. Three questionnaires were sent by post and collected by the Family Fund worker. The first 600 completed forms were used from 1242 families approached.

Table 7:1

Diagnostic Category	N	Minimum	Maximum	Mean	S.D
Behavioural and Emotional Disorders					
Age (yrs)	105	3.29	14.62	**6.90**	1.26
Townsend Score	74	-5.02	7.40	2.93	2.58
Autism Spectrum Disorders					
Age (yrs)	163	5.09	8.32	**6.56**	0.93
Townsend Score	125	-5.31	8.01	1.30	3.42
Severe Speech Disorders					
Age (yrs)	7	5.90	7.88	**6.78**	0.72
Townsend Score	5	-1.60	6.83	3.34	3.35
Learning Disability					
Age (yrs)	72	5.19	8.28	**6.78**	0.86
Townsend Score	46	-4.25	7.77	3.62	2.52
Special Senses					
Age (yrs)	19	5.28	15.36	**7.25**	2.15
Townsend Score	13	-1.16	7.60	2.79	2.71
Multisystem					
Age (yrs)	31	5.31	8.12	**6.57**	0.84
Townsend Score	23	-5.13	6.49	1.38	3.29
Central Nervous System					
Age (yrs)	33	5.22	8.08	**6.63**	0.99
Townsend Score	28	-3.94	6.81	2.54	2.76
Cerebral Palsy					
Age (yrs)	41	5.24	16.14	**6.84**	1.26
Townsend Score	35	-5.93	6.89	0.61	3.29
Neuromuscular					
Age (yrs)	11	5.16	7.43	**6.02**	0.71
Townsend Score	10	-6.02	5.29	-0.09	4.03
Orthopaedic					
Age (yrs)	19	4.30	8.36	**6.59**	1.10
Townsend Score	9	-2.07	7.35	2.46	3.31
Non-Neurological					
Age (yrs)	60	4.32	9.06	**6.59**	1.04
Townsend Score	46	-4.38	8.94	2.71	3.25
Oncology					
Age (yrs)	33	5.15	8.03	**6.43**	0.89
Townsend Score	22	-5.46	6.98	0.09	3.64

Townsend Index: Scores above zero indicate greater levels of material deprivation.

Validation

Specific patterning of LAQ domain scores by diagnostic category can be predicted, as had also been found in Jessen et al (2003) (see chapter 4 Manual).

For example:
Communication: expect greater impact (higher score) for children with speech disorders and autism.
Mobility and **Self-care**: expect greater impact for children with cerebral palsy and orthopaedic problems.
Interpersonal relations: expect greater impact for children with autism and impairments of special senses.

The tables below report mean domain scores by rank order of conditions.

Table 7:2. LAQ Communication

Diagnosis	N	Mean	Std. Deviation
Severe Speech Disorders	7	11.657	3.777
Autism Spectrum Disorders	163	9.777	5.410
Special Senses	19	9.600	3.200
Multisystem	31	9.290	5.805
Learning Disability	72	9.000	5.279
Cerebral Palsy	41	8.898	6.030
Central Nervous System	33	8.436	6.004
Behavioural and Emotional Disorders	105	7.954	4.506
Neuromuscular	12	6.000	4.634
Oncology	33	5.091	4.939
Non-Neurological	59	4.963	5.040
Orthopaedic	19	4.547	5.873

As expected, the main significant differences are noted between children with autism spectrum disorders and children with non-neurological conditions, oncology, and orthopaedic conditions.

Table 7: 3. LAQ Mobility

Diagnosis	N	Mean	Std. Deviation
Orthopaedic	19	41.349	13.466
Cerebral Palsy	41	31.535	19.416
Oncology	33	30.921	15.188
Central Nervous System	33	27.316	14.113
Neuromuscular	12	24.779	12.833
Multisystem	31	21.506	10.529
Non-Neurological	59	20.265	9.360
Behavioural and Emotional Disorders	105	18.243	8.729
Special Senses	19	17.792	5.117
Learning Disability	71	16.929	7.168
Autism Spectrum Disorders	163	16.841	8.820
Severe Speech Disorders	7	15.203	6.622

As expected, the main significant differences are between children with physical problems, such as those with orthopaedic problems and cerebral palsy, and children with autism spectrum disorders, behavioural and emotional disorders, learning disabilities, severe speech disorders and special sensory problems.

Table 7:4. LAQ Self Care

Diagnosis	N	Mean	Std. Deviation
Cerebral Palsy	41	66.415	24.233
Oncology	33	59.644	23.966
Orthopaedic	19	58.600	28.024
Central Nervous System	33	55.474	29.180
Multisystem	31	50.847	24.937
Neuromuscular	12	48.650	25.787
Autism Spectrum Disorders	163	47.866	19.027
Severe Speech Disorders	7	15.203	6.622
Learning Disability	72	43.727	21.741
Behavioural and Emotional Disorders	105	40.191	21.217
Non-Neurological	59	35.056	24.635
Special Senses	19	29.190	24.116

The main significant differences can be seen between children with problems such as cerebral palsy, oncology, and orthopaedic, and children with diagnoses of autism spectrum disorder, behavioural and emotional disorders, learning disability, non-neurological problems and special sensory problems.

Table 7:5. LAQ Domestic Life

Diagnosis	N	Mean	Std. Deviation
Cerebral Palsy	41	31.657	11.464
Oncology	33	30.381	10.631
Central Nervous System	33	29.120	13.758
Behavioural and Emotional Disorders	105	28.486	10.137
Non-Neurological	59	26.300	11.233
Autism Spectrum Disorders	163	24.399	11.597
Orthopaedic	19	23.646	11.098
Neuromuscular	12	23.573	7.595
Learning Disability	72	23.111	11.929
Multisystem	31	22.947	9.356
Special Senses	19	19.486	12.329
Severe Speech Disorders	7	15.451	8.220

The main significant differences can be seen between children with cerebral palsy and children with autism spectrum disorders, learning disability, severe speech disorders and special sensory problems.

There is also a significantly greater impact for children with behavioural and emotional disorders than children with severe speech disorders and special sensory problems.

Table 7:6. LAQ Interpersonal Interactions and Relationships

Diagnosis	N	Mean	Std. Deviation
Behavioural and Emotional Disorders	105	63.881	11.858
Autism Spectrum Disorders	163	60.644	11.064
Learning Disability	71	60.317	12.041
Special Senses	19	59.211	12.557
Central Nervous System	33	58.485	13.947
Multisystem	31	57.500	12.349
Orthopaedic	19	56.974	15.402
Cerebral Palsy	40	56.625	12.255
Severe Speech Disorders	7	55.357	8.345
Oncology	33	55.152	13.749
Non-Neurological	59	52.119	13.146
Neuromuscular	12	46.458	7.647

The main significant differences are between problems linked to social and communication problems (i.e. autism spectrum disorders, behavioural and emotional disorders, learning disability) and non-neurological and neuromuscular diagnoses.

Table 7:7. LAQ Community and Social Life

Diagnosis	N	Mean	Std. Deviation
Behavioural and Emotional Disorders	105	75.941	11.321
Autism Spectrum Disorders	163	69.144	12.844
Central Nervous System	33	65.222	16.659
Special Senses	19	65.078	15.688
Learning Disability	72	63.680	14.328
Orthopaedic	19	61.238	14.466
Cerebral Palsy	41	61.159	14.047
Multisystem	31	59.706	17.925
Non-Neurological	59	58.511	17.230
Oncology	33	55.447	12.046
Neuromuscular	12	55.360	10.187
Severe Speech Disorders	7	53.760	12.590

The main significant differences can be seen between children with behavioural and emotional disorders and the majority of other diagnoses (i.e. autism spectrum disorders, cerebral palsy, learning disability, multisystem disorders, neuromuscular, non-neurological, oncology, and orthopaedic).

Other significant differences can be seen between children with autism spectrum disorders, and those with neuromuscular problems, non-neurological problems and oncology.

Age

The mean age of the children whose parents had applied to the Family Fund was 6 years 8 months. The range was from 3 years to 16 years, but the majority were aged between 5 and 8 years. The impact on **Mobility** and on **Domestic life** was greatest in those aged 5 years and below, and 8 years and above. The impact on **Self-care** was greatest in those aged 5 years and below, as might well be expected.

Socio-economic status

Those families who had above average levels of deprivation reported greater impact on the **Communication, Mobility** and **Interpersonal Interactions and Relationships** domains than more advantaged families.

Conclusion

The patterns are as predicted for the domain scores. The impact on the **Community and Social Life** domain of the social communication disorders, rather than physical impairments, is very noticeable.

Simplification

Categorical principal components analysis was used to explore the dimensions within the LAQ-G, utilising this large dataset.

Table 7:8.

LAQ items within each dimension		Total variance accounted for and dimension loading
		Sample (n = 598)
Domain	**Dimension 1: *Functional ability***	**16.10%**
		Cronbach's Alpha = .882
SC	Q1G: Getting in and out of a car	**0.71**
SC	Q1J: Carrying drink across the room	**0.66**
MO	Q1D: Getting out of bed	**0.65**
DL	Q1B: Eating a bowl of cereal	**0.63**
SC	Q1C: Putting on a vest/T-shirt	**0.63**
SC	Q1A: Help washing hands	**0.62**
SC	Q1F: Going to the toilet	**0.62**
SC	Q1E: Getting out of the bath	**0.63**
MO	Q1I: Picking up something from the floor	**0.62**
MO	Q12: Times child needed to be lifted	**0.61**
MO	Q21: Access 2 (Rooms child entered without any help)	**0.54**
IIR	Q1H: Doing up buttons or buckles	**0.53**
CSL	Q6: Time child spent occupying themselves	**0.47**
IIR	Q2: Times up for your child during the night	**0.43**
MO	Q20: New adaptations planned or necessary for the future	**-0.39**
CO	Q9: Child's communicative ability	**0.39**
DL	Q29: Child's difficulties have resulted in financial problems	**0.38**
MO	Q19: Number of home adaptations over the last year	**0.37**
DL	Q14: Number of times child given treatment/medicine	**0.34**
DL	Q24: Furthest distance child has gone without your help	**-0.33**
MO	Q21: Access 1 (Rooms child has entered over the past week)	**0.32**

CO = Communication**; MO** = Mobility; **SC** = Self Care; **DL** = Domestic Life; **IIR** = Interpersonal Interactions and Relationships; **CSL** = Community and Social Life.
Cut Off: 0.30

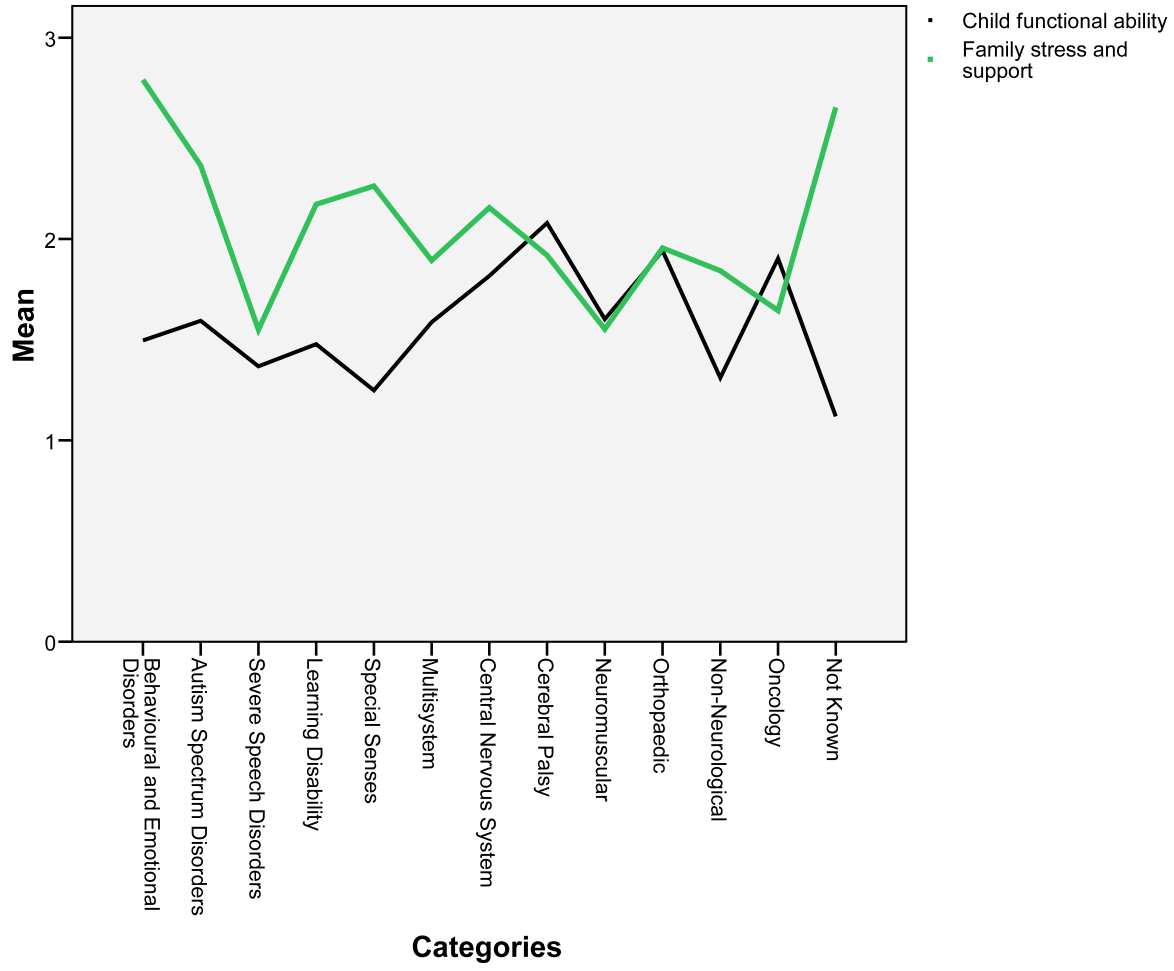
LAQ items within each dimension		Total variance accounted for and dimension loading
		Sample (n = 598)
Domain	**Dimension 2: *Family stress and support***	**10.48%**
		Cronbach's Alpha = .806
IIR	Q7: Child has been difficult to manage or control	**0.74**
CSL	Q4: Child has quarrelled with friends or siblings	**0.70**
IIR	Q10: Child has been noisy	**0.67**
MO	Q11: Child needs essential special equipment	**-0.51**
CSL	Q5: Child played with any games or toys yesterday	**0.51**
CSL	Q18: Extra stress on parent/carer	**0.51**
CSL	Q17: Child's difficulties has restricted social life	**-0.47**
IIR	Q16: Extra stress on siblings	**0.44**
CSL	Q32: Difficulties getting the right care	**-0.44**
CSL	Q34: Local people supportive and understanding	**0.42**
CSL	Q15: Difficulties organising outings/holidays as a family	**-0.38**
CSL	Q33: Child at the right school	**0.37**
CSL	Q33: Society in general supportive and understanding	**0.30**

Items missing from the 2 dimension solution	
Domain	
IIR	Q3: Child seen his or her friends outside of school hours
CO	Q8: Child's usual way of communicating
CSL	Q13: Changed work situation because of child's condition
IIR	Q22: Times child has left home without an adult
IIR	Q23: Times child has been on a longer outing which required transport
CSL	Q25: Time taken for child to travel from home to school
IIR	Q26: School activities
DL	Q28: Number of school days missed
DL	Q30: Number of home visits from professionals
DL	Q31: Made contact with professionals because of child's difficulties
CSL	Q15: Changed work
DL	Q37: Professional Contact
CSL	Q41: Can get break

The two dimensions seem to represent *Child Functional Ability* and *Family Stress and Support*. *Child Functional Ability* correlates most highly with the original domains of **Communication** (r = .456), **Mobility** (r = .652), **Self-care** (r = .922) and **Domestic Life** (r = .558) whereas *Family Stress and Support* has higher correlations with **Interpersonal Interactions and Relationships** (r = .680) and with **Community and Social Life** (r = .912).

Item scores for each individual were divided by the number of items in each dimension. The relationships between mean dimension scores and diagnostic categories are displayed in Figure 7:1.

Figure 7:1.



Age was found significantly related to *Child Functional Ability* with younger children having raised scores. Age was not related to *Family Stress and Support.* In contrast, gender was not related to *Child Functional Ability,* but scores on *Family Stress and Support* were significantly higher for boys than for girls ($t = -4.668$, $p<0.001$). Children from families with above average material deprivation had higher scores on *Family Stress and Support* than more advantaged children ($t = -2.118$, $p<0.05$).

Conclusion

The principal components analysis of the LAQ-G has provided two interpretable dimensions, *Child Functional Ability* and *Family Stress and Support*. The scores relate to diagnostic category, age, gender and material deprivation in ways which validate the dimensions. These two scores could be used in a number of ways, for example, in analysis of outcomes of intervention where the goals concern the individual child (to improve child's functional ability), or where the goals concern the child within the family (to lessen family stress and boost support).

Essentially, this analysis has highlighted some limitations of LAQ-G as a potential measure of *Participation* as defined in the International Classification of Functioning, Disability and Health (ICF) (WHO 2001). The items which drop out of the analysis (see Table 7:8 above) are primarily those which most seem to represent '**Social Participation'**. They do not form a cohesive dimension, so cannot be combined in a score. However, the LAQ-G items could be used individually as a measure of particular interventions at a community level, such as provision of personal assistance, or introduction of a key professional to support the family.

References

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