MEASURING PERCEPTIONS OF QUALITY OF PUBLIC SERVICES

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Introduction

Any discussion of 'quality' must take it as axiomatic that the ways in which quality is defined and the technical measures used to determine it are not 'value-free' or 'neutral'. Rather, as Pollitt and Bouckaert [1995] argue forcibly, notions of quality have to be seen as intrinsically bound up with the interests and values of the groups (professional,managerial) who are laying claim to their usage of the term. It is possible to approach quality measures by examining inputs, processes,outputs and indeed outcomes. Different 'key players' may approach their concerns over quality by focussing on different aspects of input-process-output models. For example, professional groups such as doctors may well prefer process-oriented and 'peer-oriented' approaches to quality whilst managers may prefer quantitative measures of output that appear to demonstrate a 'harder' and greater 'scientific' validity.

One definition of Total Quality Management by Mossard [1991] explicitly includes reference to quantitative techniques :

> 'the application of quantitative methods and human resources to improve the material and services supplied to an organisation, and the degree to which the needs of the customer are met, now and in the future'

Whatever concept of quality is held, there is a broad consensus that the concept of quality needs to be operationalised in order that performance can be measured. Any indicators or measures that are derived may well need to be interpreted with some care. There is a particular danger that measures themselves may be interpreted as having a 'reality' which may not be justified. In particular, it is important that the measure is not confused with the underlying 'phenomenological reality' of that which is being measured, particularly in the case of healthcare data.

User-centred approaches to quality

Despite the primacy of the 'customer/consumer' in the TQM literature, it is perhaps surprising that many of the measures that have traditionally been used to define quality have been essentially 'producer' rather than 'consumer' led. These difficulties are not alleviated either, when we attempt to apply the philosophies and methods of TQM to public provided services, particularly in the fields of health, education and welfare. Morgan and Murgatroyd [1994] argue that when TQM methods are applied to health, education and welfare fields:

- Performance Indicators do not 'speak for themselves' but have to be interpreted
- Many performance indicators are overly simplistic
- Few of the available indicators focus on customer satisfaction.

The lack of focus upon consumer satisfaction may well be explained by the structural position of the consumer vis-a-vis the relevant professionals. If one accepts that the only person capable of giving a technical assessment of the work of a professional is that of a similarly qualified fellow-professional, then how is the consumer to judge the quality of the service that has been provided? In practice, the quality of a service may well be judged by reference to output measures (waiting times, discharge rates, examination successes) according to criteria which have been promulgated either by professional managers or by government guidelines in the form of a Charter standard.

However, Ranade [1994] argues that in a service industry such as healthcare, there are good theoretical grounds for making the user's experience central rather than peripheral to definitions of quality:

> 'Consumers judge quality by comparing the service they receive against expectations of what they should receive. Both perceptions and expectations are experiential states of mind rather than necessarily *real* ... In services like health care or education, the experience of the user is the product being consumed. The behaviour of the consumer is also an integral part of the production process. For example, the extent to which patients like or trust the doctor and nurse may affect their willingness to cooperate in their treatment'

The patient satisfaction survey is one of the most common methods deployed to involve the participation of users. However, a degree of concern has been expressed that this instrument is too crude either as a management tool or as a research instrument. Carr-Hill's [1992] extensive review of the literature on patient satisfaction surveys concludes that the majority of surveys do not have an adequate conceptual underpinning of the concept of 'satisfaction',do little to tap sources of dissatisfaction rather than satisfaction and often have grave technical deficiencies in the handling of both initial sampling and the treatment of non-response rates. It could well be that there are vested interests in not conducting patient satisfaction surveys with any degree of rigour - the more superficial the survey, the higher the level of perceived satisfaction tends to be and vice versa. For example, whilst studies of in-patients have shown a satisfaction rating of 85-90 per cent, Carstairs [1970] showed how the volume of content was a more sensitive indicator than the measure itself. In the light of surveys that may over-represent the true satisfaction rate,Carr-Hill [1992] advocates the use of a 'multiple discrepancy' model which recognises that respondents' expressed satisfaction is a relative judgement, involving a comparison between perceived health status and aspirations.

An approach will now be detailed which addresses one of the specific questions raised by Ranade and by Carr-Hill i.e. the relationship between the consumer's expectations of a service and the perception of the service as actually experienced. This recognises the fact that instruments which only measure 'satisfaction' are inadequate. What is required is a system of measurement which addresses the issue that consumers have expectations of a service as well as actual experience of it. 'Satisfaction' is then located in a relativistic context and needs to be interpreted in the context of prior expectations.

This issue has already been addressed by analysts who have been concerned to address the issues of quality in service industries. Use will be made of a systematically developed measurement tool which measures the gap between expectations and perceptions of quality in a way that can be adapted for any service industry, provided either in the private sector (e.g. insurance, banking) or in the public sector (such as healthcare)

'Customers' or 'Consumers'?

It may be pertinent to note at this point that the terms 'customer' and 'consumer' are often used interchangeably in the TQM literature. The import of the difference between a 'consumer' who experiences a service and a 'customer' who pays for it is often glossed over or ignored. For example, Parasuraman,Zeithaml and Berry [1988] - the developers of the **SERVQUAL** methodology to be outlined shortly -entitled the report that they made to their funding body, the Marketing Science Institute:

> ***'SERVQUAL:*** *A Multiple-Item Scale for Measuring Customer Perceptions of Service Quality'*

but in their account of their research published in the *Journal of Retailing* the word *'Customer'* had become *'Consumer'*. However, the authors are in good company as W. Edwards Deming, one of the 'gurus' of the TQM movement in his most seminal work *'Out of the Crisis'* in Ch. 6 'Quality and the Consumer' has the following sub-heading: 'The consumer,the most important part of the production line' whilst the first line of the ensuing paragraph reads:

> *'The **customer** is the most important part of the production line'*
> (emphasis added*)*

This confusion has particular consequences when we come to apply TQM philosophies to publicly provided services where the role of the consumer is often very clear whilst that of customer is not.

Only very few writers on TQM have addressed themselves to this issue. Traditionally, TQM has used the term 'customer' to denote whosoever receives a service. According to this formulation, all organisations who contribute to or benefit from the formulation of a product become 'customers' and hence organisations will typically have a range of 'internal' as well as traditional 'external' customers. Martin [1993] when applying TQM concepts to human service organisations recognises that clients may receive services without directly paying for them whilst funding organisations may pay for services whilst not directly consuming

them. He advocates that external customers should be classified either as 'client' customers or as 'funding source' customers. Broadening the definition of customers in this way complicates the analysis. One solution is that different quality standards apply to different classes of customer i.e. funding-source customers may specify certain minimum quality standards as 'floors' or as 'thresholds' whilst 'client customers' may judge the quality of a service by more conventional criteria such as reliability, timeliness and so on.

The SERVQUAL instrument for the measurement of quality in service industries.

The **SERVQUAL** methodology is well-known in TQM circles as probably the most systematic approach to the measurement of perceptions of quality in service industries. A fundamental principle in this approach is that it is necessary to measure the difference between consumers' prior expectations of a service and the quality of the service as actually experienced. (In the light of the foregoing discussion, the term 'consumer' will now be used throughout whereas in the original source documents, the word 'customer' is often one suspects inadvertently, taken to be a synonym for 'consumer')

Five dimensions of service quality have been derived:

- **Tangibles:** Physical facilities, equipment and appearance of personnel
- **Reliability:** Ability to perform the promised service dependably and accurately
- **Responsiveness:** Willingness to help consumers and provide prompt service
- **Assurance:** Knowledge and courtesy of employees and their ability to inspire trust and confidence
- **Empathy:** caring, individualised attention the organisation provides the consumers of its services

The gap between ***expectations*** and ***perceptions*** is then measured across these five dimensions by the application of an adaptable 22-item survey instrument on a 7-point scale. Since each dimension may not be regarded as equally important, consumers are invited to allocate points (summing to 100) to reflect the relative importance of each of the five dimensions to them.

This approach has several inherent advantages compared with a more traditional customer satisfaction survey. In particular, it is possible to weight the importance that consumers attach to one particular element of a service and this makes the instrument as a whole particularly valuable when used across a range of different service industries. For example, one could hypothesise that a factor such as 'empathy' is more importance to consumers of healthcare than it is to purchasers of insurance. Moreover, it is possible to rate expectations against perceptions on each of the five

dimensions outlined above. This makes **SERVQUAL** a powerful managerial tool as well as a research instrument as it can delimit fairly precisely those dimensions of the scale in which the gap between expectations and perceptions is widest. Managers can extend this 'gap analysis' if they wish but it is evident that the data from **SERVQUAL** surveys can be used to make comparisons between similar sub-units (e.g. different branch libraries of a public library service) as well as comparisons over time. Because of the rigorous statistical testing to which **SERVQUAL** has been subject in the course of its development, both researchers and managers can use the instrument as a powerful diagnostic instrument which has been shown to yield reliable results over a wide range of service industries.

The application of SERVQUAL to local authority services in the UK.

Although developed in the 1980's, the principal use of the **SERVQUAL** methodology has been in the USA and Canada. Only recently have attempts been made to apply the **SERVQUAL** instrument to the public sector in a British context. However, Dalrymple [1995] et. al. have recently reported the results of using **SERVQUAL** for a variety of services provided by Scottish local authorities and these are reported below, together with data from five large service sector industries in the USA that Zeithaml et.al.[1990] use as a benchmark for their model:

Table 1 : Benchmarking of SERVQUAL in 5 American service industries

Dimension	**Weight**	**USA Studies** (2 banks, 2 insurance companies, 1 credit card company)		
		Perceptions [P]	**Expectations [E]**	**Gap [P-E]**
Tangibles	11	5.54	5.16	+0.38
Reliability	32	5.16	6.44	-1.28
Responsiveness	22	5.20	6.36	-1.16
Assurance	19	5.50	6.50	-1.00
Empathy	16	5.16	6.28	-1.12
	Weighted av.	**5.28**	**6.27**	**-0.99**
n=	**1936**			

Table 2 : Application of SERVQUAL to a Scottish Public Library Service

Dimension	Weight	Public Library Service (Scotland)		
		Perceptions [P]	Expectations [E]	Gap [P-E]
Tangibles	18	5.68	5.93	-0.25
Reliability	23	6.10	6.30	-0.20
Responsiveness	22	6.62	6.51	+0.11
Assurance	21	6.58	6.29	+0.29
Empathy	17	6.28	6.27	+0.01
n=	**368**			
Weighted av.		**6.33**	**6.33**	**0.00**

Table 3 : Application of SERVQUAL to a Scottish Home Help Service

Dimension	Weight	Home Help Service (Scotland)		
		Perceptions [P]	Expectations [E]	Gap [P-E]
Tangibles	17	5.28	4.72	+0.56
Reliability	20	5.91	5.47	+0.44
Responsiveness	21	6.33	5.74	+0.59
Assurance	21	6.40	5.93	+0.47
Empathy	21	6.06	5.62	+0.44
n=	**124**			
Weighted av.		**6.03**	**5.53**	**+0.50**

An examination of the comparisons between the American and the Scottish data reveals the following :

- The gap between expectations and perceptions is nearly -1.00 in the American data whereas the Scottish data shows that perceptions are equal to or even exceed expectations.

- The public's perception of the quality of publicly provided services seems to be higher than the American public's perception of the services provided by the private sector. Of course, one is not comparing similar entities but the conclusions are tantalising

- Notice that in the case of the Home Help Service, a positive gap should not be greeted too enthusiastically by managers as this is explained by

low expectations rather than a very high 'perceptions' score. Again, the implications are intriguing in that dampening expectations could result in heightening the apparent relative satisfaction with services as actually delivered. In this particular case, a more likely explanation is the client's lack of prior knowledge as to the elements of an 'ideal' home help service.

Pilot Study of SERVQUAL in NHS Outpatient Clinics

The following data represents the results of an initial *pilot* study into the use of **SERVQUAL** in three out-patient clinics in Leicestershire,U.K. The purposes of the pilot were to test out the implementation of the **SERVQUAL** instrument in an NHS context and is to be seen as a precursor involving clinics across both the private and the public sector both in the UK and in Scotland. In view of the fairly small sample size, the raw results are complemented by a table of confidence intervals which indicates the ranges into which the means are likely to fall when a much larger sample is obtained.

Three clinics were chosen to represent a range of specialties and included a paediatric, enuresis and diabetes clinic. The results are presented in *Table 4:*

Table 4 : Application to SERVQUAL to Outpatient Clinics (Leicestershire,UK)
July 1995

Dimension	**Weight**	**Out-Patient Clinics (Leicestershire)**		
		Perceptions [P]	**Expectations [E]**	**Gap [P-E]**
Tangibles	14	5.17	5.24	-0.08
Reliability	26	5.52	6.32	-0.79
Responsiveness	21	5.84	6.19	-0.36
Assurance	19	5.93	6.43	-0.50
Empathy	20	5.61	6.17	-0.56
n=	**50**			
	Weighted av.	**5.63**	**6.13**	**-0.50**

Table 5 : Confidence Intervals for values obtained in Table 4

		n	mean	Standard deviation	Standard error of mean	95.00 Percent C.I.
Tangibles	**(P)**	50	5.165	1.1711	0.1656	(4.8321, 5.4979)
	(E)	50	5.240	1.1517	0.1629	(4.9126, 5.5674)
Reliability	**(P)**	50	5.524	1.1992	0.1696	(5.1831, 5.8649)
	(E)	50	6.316	0.6774	0.0958	(6.1234, 6.5086)
Responsiveness	**(P)**	50	5.835	1.1142	0.1576	(5.5183, 6.1517)
	(E)	50	6.190	0.7484	0.1058	(5.9773, 6.4027)
Assurance	**(P)**	50	5.925	1.0894	0.1541	(5.6153, 6.2347)
	(E)	50	6.425	0.6473	0.0915	(6.2410, 6.6090)
Empathy	**(P)**	50	5.608	1.2629	0.1786	(5.2490, 5.9670)
	(E)	50	6.172	0.7897	0.1117	(5.9475, 6.3965)

The table of confidence intervals displays the ranges within which the means of the population (or a very much larger sample) are likely to fall,at the 95 confidence level. On average, it is possible to say that the mean of a much larger sample will be in the range of the mean 0.273

The final table in this series summarises the results of the four sets of studies:

Table 6 : Summary table of SERVQUAL scores

	Perceptions [P]	**Expectations [E]**	**Gap [P-E]**	
American data	5.28	6.27	-0.99	(n=1936)
Scottish (Libraries)	6.33	6.33	0.00	(n= 368)
Scottish (Home Help)	6.03	5.53	0.50	(n= 124)
English (Outpatients)	5.63	6.13	-0.50	(n= 50)

It is interesting to observe that the Scottish/English data reveals much more similarity than the comparison with the American private sector studies. This could well be due to cross-cultural differences in the way in which even apparently identical questions are rated.

The expectations of the English sample were highly consistent with those of the Scottish sample. Whilst the perceptions of patients of outpatient clinics were lower than the sample of Scottish local authority consumers, the figure is still higher than the 'benchmarking' standard of American private sector consumers.

The studies taken collectively reveal that the dimension of 'Tangibles' is always accorded the lowest weight whilst that of 'Reliability' is rated as the most important factor in four of the five sets of studies (and second highest in the remaining study). As one might expect, the factor of 'Empathy' receives a low weighting in the case of the American private sector service industries but a higher rating in the 'Home Help' and 'Outpatient' samples where these factors are considered to have a higher degree of salience. Managers of outpatient clinics could look at the relatively high negative weighting given to the reliability dimension which might provide an indication of the directions in which quality improvement efforts should be directed.

Extensions of the SERVQUAL methodology

Whilst the authors of **SERVQUAL** took considerable pains to ensure that the measuring instrument had a high degree of construct validity, it is still possible that further refinements may be made.

The scale upon which consumers are invited to circle their response is a conventional Likert scale (from 1-7) centering on the figure 4. The research instrument relies upon measuring the gap between expectations and perceptions and this process is achieved by simple arithmetic - for example, an expectation score of 6 followed by a perception score of 4 would produce a score of -2 on that particular question in the instrument.

An assumption is that one may arrive at a 'gap score' by a simple process of subtraction. This process would always be legitimate if one could be assured that when consumers were filling in their rating scales they were employing in their minds an essentially linear 'equal-distance' measurement scale. In such a scale, the 'distance' from the central point of neutrality to a point to its left or its right would be worth as much as a movement from point 6 to point 7. However, is this a realistic assumption? It is theoretically possible that respondents could carry round in their heads an essentially linear 'equal-distance' model but it is also as likely that other models of rating activity could be employed. As well as a linear scale, it is just as possible that respondents could carry round in their heads what might be termed the 'increasing resistance' model (similar to pushing against a coiled spring) in which movement from the central point to a point immediately on one side or the other is relatively easy but thereafter it takes greater effort to move towards extremes of a scale.

In order to test out this assumption, the author invited a sample of undergraduate students to indicate (on a four point scale!) whether it would be *very easy, quite easy, quite difficult* or *very difficult* to perform the following 'movements' along a quality scale:

(1) From the central point **(4)** to one on either side (**3** or **5**)

(2) To move from points **3** or **5** to points **2** or **6**
(3) Finally, to move from points **2** or **6** to the extremes of the Scale (points **1** or **7**)

The **TURBOSTATS** statistical package, Hart [1993], was used to undertake tests of significance. The following Kolmogorov-Smirnov test results were obtained indicating that respondents generally found it 'more difficult' to experience elements of service that would move them towards/away from extreme points on the scale as opposed to intermediate points on the scale. Whilst not conclusive, this is certainly quite powerful evidence in favour of the 'increasing difficulty' model rather than the 'equal distance' model of rating behaviour.

Table 7 : Comparison of 'Movement from Centre' with 'Movement from Intermediate' points

KOLMOGOROV-SMIRNOV two-sample test of FREQUENCY DISTRIBUTIONS

	CENTRE				INTER		
Value	Frequency	Percent.	Cumul. Percent		Cumul. Percent	Percent.	Frequency
1	46	60.5	60.5		21.1	21.1	16
2	22	28.9	89.5	<39.5>	69.7	48.7	37
3	6	7.9	97.4		96.1	26.3	20
4	2	2.6	100.0		100.0	3.9	3
TOTALS	76						76

For significance, maximum difference between cumulative frequencies needs to exceed 19.8 [10%] level or 22.0 [5%] level or 26.4 [1%] level

Maximum difference between rows is 39.5 which is SIGNIFICANT at 1% level

Table 8 : Comparison of 'Movement from Intermediate Points' with 'Movement to Extreme' points

KOLMOGOROV-SMIRNOV two-sample test of FREQUENCY DISTRIBUTIONS

Value	INTER Frequency	Percent.	Cumul. Percent		Cumul. Percent	EXTREME Percent.	Frequency
1	16	21.1	21.1		23.7	23.7	18
2	37	48.7	69.7	< 23.7 >	46.1	22.4	17
3	20	26.3	96.1		80.3	34.2	26
4	3	3.9	100.0		100.0	19.7	15
TOTALS	76						76

For significance, maximum difference between cumulative frequencies needs to exceed 19.8 [10%] level or 22.0 [5%] level or 26.4 [1%] level

Maximum difference between rows is 23.7 which is SIGNIFICANT at 5% level

Table 9 : Comparison of 'Movement from Centre' with 'Movement to Extreme' points

KOLMOGOROV-SMIRNOV two-sample test of FREQUENCY DISTRIBUTIONS

Value	CENTRE Frequency	Percent.	Cumul. Percent		Cumul. Percent	EXTREME Percent.	Frequency
1	46	60.5	60.5		23.7	23.7	18
2	22	28.9	89.5	<43.4>	46.1	22.4	17
3	6	7.9	97.4		80.3	34.2	26
4	2	2.6	100.0		100.0	19.7	15
TOTALS	76						76

For significance, maximum difference between cumulative frequencies needs to exceed 19.8 [10%] level or 22.0 [5%] level or 26.4 [1%] level

Maximum difference between rows is 43.4 which is SIGNIFICANT at 1% level

The same methodological research also asked respondents how they actually used rating scales by asking the question:

'If point 4 represents 50% on a scale from 1-100, then where would you put :

point 2 ___ **point 3 ___** **point 5 ___** **point 6 ___**

and the answers were then analysed to discern whether respondents replied using 'equidistant' points and indeed whether the distribution of points was symmetrical. The following results were obtained:

Table 10 : Numbers of respondents deploying an exactly 'Equidistant' scale

EQUI Equidistant scale ?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	5	6.6	6.7	6.7
No	2	70	92.1	93.3	100.0
	0	1	1.3	MISSING	
		75	100.0	100.0	

Valid Cases 75 Missing Cases 1

Table 11 : Numbers of respondents deploying a symmetrical scale

SYMM Symmetrical scale ?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	36	47.4	48.6	48.6
No	2	38	50.0	51.4	100.0
	0	2	2.6	MISSING	
		76	100.0	100.0	

Valid Cases 74 Missing Cases 2

The combination of these two sets of results again casts strong doubts that when answering Likert scales, individuals use an essentially 'equal-distance' scale in their minds. Whilst these results are suggestive rather than definitive, they are highly supportive of the 'increasing difficulty' model in which it becomes more difficult, in a psychological sense, to move towards the extreme points of the scale.

What is needed, therefore ,is a scale in which the 'distance' from the penultimate to the extreme points of the scale are 'worth more' than movements from a central point to immediately adjacent points.

One way to approach this is to use the binomial distribution in the shape of Pascal's triangle to discern probabilities forming a 'natural' normal distribution. The appropriate probabilities from a sample size of 8 in Pascal's triangle are :

1 8 28 56 70 56 28 8 1

which generates 9 probabilities. This scale, truncated at each end to avoid problems associated with measurement only at the integer level, has the following properties

8 28 56 70 56 28 8

Each probability as a multiple of its 'neighbour'	1.25	2.00	3.5
Standardised so that the first point becomes 1.00	1.00	1.60	2.8
Gap rounded to nearest integer	1	2	3

Points on the scale	**4**	**5**	**6**	**7**
Resultant values	**0**	**1**	**3**	**6**

We have now derived a scale in which the 'distances' are given values as follows:

- movement from a central point to its immediate neighbour **= 1**
- the next point along is worth 'more than' 1 additional point (actually 2 points) **= 3**
- movement from the penultimate point to the extreme is worth 3 additional points **= 6**

The resultant scale now appears as follows:

Points on the scale	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Values associated with each point	**-6**	**-3**	**1**	**0**	**1**	**3**	**6**

This reformulated scale has not, as yet, been used to calculate or to recalculate any of the **SERVQUAL scores** indicated above. However, it does represent one way in which it is possible to refine an already well-developed methodology

in order to increase its discriminant power. The **SERVQUAL** methodology has already been used in a large number of studies on the North American continent. It may well prove its worth, both as a research instrument and as a practical management tool, when deployed either individually or in conjunction with other techniques, to measure perceptions of quality of publicly provided services in a European context.

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