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Visual Analog Scales (VAS) & This Much!: Introduction & Bibliography

Helping professionals to help children

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Introduction

For many children and some adults, "How Much?" can be a very difficult question to answer, and is also one which often elicits responses that are very difficult to quantify. Fortunately, for most purposes this is not a major problem, and feelings & preferences can be discussed or negotiated informally, even light heartedly.

However, in some situations relative strength of feelings, or changes in subjective experiences over time can be of enormous importance. For example, when helping a sick child communicate the severity of pain he or she is experiencing, professionals are playing a crucial role in both ensuring adequate analgesia, but also in monitoring recovery. Whether the pain today is less or more than it was yesterday, is of critical importance.

Many other facets of children’s lives and experience, such as fears and other emotions about relationships, school, loss, may also be very important to assess with some accuracy.

Similarly, adults with an intellectual disability, autistic spectrum disorder or other mental health problems may also struggle to communicate their preferences, feelings or wishes - and as a consequence may suffer poorly informed decisions made on their behalf.

Psychologists, counsellors and other therapists working with adults and children often need to measure symptoms prior to, during and following intervention, in order to evaluate the effectiveness of an intervention. Where standardised psychometric measures exist relating to particular symptoms, it may be possible to use them. However, these are often quite complex and intimidating, making it very difficult to obtain valid and reliable measures.

This Much!, is an iPad\(^1\) app designed to help assessment of children and also adults with a disability or mental health problems. The aim is to support self report in such a way as to promote assessment and therapy, as well as empirical research. It is designed to help answer questions about circumstances and people which elicit a range of feelings. This Much! can be used to generate data which can be subjected to quantitative analysis. However, it can also be used to interactively explore experiences and even negotiate therapeutic goals with a child or adult with a disability, using graphic visual representations. (You can access a brief overview video here)

Although highly flexible and customisable, at the heart of This Much! is a simple Visual Analogue Scale (VAS).

\(^1\) This Much! Also runs on Mac and Windows computers.
Visual Analogue Scales

A VAS is a very simple and effective means of measuring attitudes, feelings, wishes and beliefs. At its simplest, a VAS consists of a line upon which a person is invited to draw a mark indicating the extent or degree they associate with a property or condition.

For example, a line might be drawn and labelled 'anxiety in public places'. One end might be marked zero, or "no anxiety" and the other 100, or "maximum anxiety".

Similarly, a scale might be labelled regarding severity of pain. In the following example, the mark might either be interpreted as representing a ratio of actual to possible pain severity. Alternatively, it might be placed within a series of repeated assessments in order to give a measure of improvement or deterioration in condition.

Of course, the questions asked and labels adopted may be more or less complex and sophisticated, and may relate to different events and circumstances. Some scales are presented vertically, rather than horizontally (although there is little compelling evidence this makes much difference). Others are subdivided into segments (often 5 or 7), and 'calibrated' or 'anchored' with textual descriptors or images. Overall, the visual analogue scale is an incredibly simple and flexible technique, which has been used in a great deal of empirical research, as well as more clinically oriented assessment.

The point at which the mark is made is interpreted as indicating the severity of anxiety experienced. In the paper and pencil version of the assessment a ruler is used to measure the number of millimetres from the origin of the scale. Computerised versions sometimes impose a different range of numbers on the scale, and sometimes report an arbitrary property such as the number of pixels from the origin.

It is important to remember that although the numbers generated by a VAS might appear to offer very fine distinctions and ratio data, the actual precision of the scale is certain to be considerably less, and whether the data generated
should be treated as ordinal, interval or ratio is an important consideration\(^2\). One rule of thumb is to assume that any scale VAS is roughly equivalent to a 7 (or at best 10) point scale, unless there is empirical evidence that it is more or less sensitive. On the other hand, there is evidence that placing multiple elements on a single scale offers greater precision\(^3\).

One of the drawbacks of paper and pencil VAS is that they can be rather difficult for less able individuals to understand. For example children, those with a learning disability or autistic spectrum disorder, may struggle to perceive the scale as a representation of an internal state, understand what is required of them, or have the skill or confidence to make the mark on paper using a pen. Nevertheless, visual analogue scales have been used with adults with a disability, and also with children. With respect to the latter, they are commonly used in order to enable children to report the severity of pain suffered prior to, during and following surgical intervention.

A great advantage of using a VAS app is that each child’s ability to understand and use a scale can be both explored and enhanced by practice. To this end a number of induction ‘stories’ have been developed, and can be downloaded from the [This Much! web page](https://www.childandfamilytraining.com).

**Unipolar or Bipolar scales?**

Some assessments are better served by using unipolar scales, and others to bipolar scales. However, ‘personal construct’ psychologists believe that both children and adults naturally tend to apply bipolar scales to their experiences and beliefs about the world, themselves and other people.

Deciding which approach to adopt is a matter of choice for the professional involved in assessment. This is likely to depend on the purpose to which the results of the assessment might be put, and the particular cognitive characteristics of the individual being assessed. Unipolar scales are more simple to understand and use, but give less sophisticated, perhaps less individually salient information.

Bipolar scales can be quite idiosyncratic in both construction and psychological application, particularly in the case of social constructs. It is therefore very easy for a professional to provide a bipolar construct which has face validity, but which may not correspond to the evaluation used by a particular individual in their day to day life. For example, one person might typically evaluate others using the scale *Scared*<---*Strong*, another using the scale *Weak*<---*Strong*, and yet another *Weak*<---*Logical*. This information alone gives an

\(^2\) For example, see Couper (2006) and Vautier (2011).

\(^3\) See Granqvist, (2003)
important insight into the values and experiences of the person, and also offers a powerful tool for measuring his or her evaluations of others.

This Much! allows the professional to decide on the best approach given the circumstances of the assessment. It can even be used to elicit and explore (both qualitatively and quantitatively) bipolar constructs, and then apply them to different individuals or situations. Alternatively, This Much! can be used to quantify responses to a number of unipolar dimensions (such as the pain example above), the data from which can be aggregated across individuals and reported in group research.

VAS bibliography

The following bibliography has not been ‘cherry picked’ to only include papers praising the virtues of VAS. It includes papers which critically evaluate the approach. Notwithstanding the limitations of VAS, the overall message that emerges is that most variants are remarkably simple, flexible and effective psychometric procedures. If used carefully, they offer a great deal to those who engage in evidence based practice - particularly in contexts in which other assessments are unwieldy, inappropriate or simply unavailable.

Although practitioners should feel free to use and (carefully) interpret such scales in day to day work, it is important to be aware of the limitations of VAS, some of which have been alluded to above. Those proposing to use VAS and indeed This Much! in research would do well to read the literature carefully.


retest reliability of scaling methods for health states: the visual analogue scale and the
time trade-off. *Quality of Life Research*. 8(4):303-10


A New Scale for Clinical and Research Use *Epilepsia* 42(1):104-12

Visual Analogue Scale. *Nursing Research*, 41(6),


related fatigue: content validity and psychometric performance of the Fatigue Visual
Analog Scale in adult patients with fibromyalgia. *Clinical and experimental
rheumatology*, 29(6 Suppl 69), S34–43.

visual analogue scale as valid, reliable and responsive as multi-item scales in

in the immediate postoperative period: intrasubject variability and correlation with a

W., & Katz, N. P. (2012). Determining the clinically important difference in visual analog
scale scores in abuse liability studies evaluating novel opioid formulations. *Quality of
Life Research*, 21(6), 975–981. doi:10.1007/s11136-011-0012-7

Franchignoni, F., Salaffi, F., & Tesio, L. (2012). How should we use the visual analogue
scale (VAS) in rehabilitation outcomes? I:How much of what? The seductive VAS
numbers are not true measures. *Journal of rehabilitation medicine : official journal of
the UEMS European Board of Physical and Rehabilitation Medicine*, 44(8), 798–799.

changes in pain severity measured on a visual analog scale. *Annals of emergency


Kersten, P., Küçükdeveci, A. A., & Tennant, A. (2012a). How should we use the visual analogue scale (VAS) in rehabilitation outcomes?IV: Reply on “How should we use the visual analogue scale (VAS) in rehabilitation outcomes?.” *Journal of rehabilitation medicine : official journal of the UEMS European Board of Physical and Rehabilitation Medicine*, 44(8), 803–804.


Scale (CES-D) for the idiographic measurement of depression. Journal of affective disorders, 128(3), 220–234.


