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VAS Generator: A Web based tool for creating Visual Analogue Scales

Introduction

Visual analogue scales (VAS) are continuous measurement devices (e.g. Flynn, van Schaik & van Wersh, 2004). **VAS Generator (http://www.vasgenerator.net)** is a free Web service for creating a wide range of VAS that can be used as a measurement device in Web surveying and Web experimentation, and also for local computerized assessment. VAS Generator and the generated scales work platform-independent, the underlying languages are HTML and JavaScript. Resulting scales can easily be added to surveys and experiments generated with other Web services like SurveyWiz (Birnbaum, 2000) and WEXTOR (Reips & Neuhaus, 2002).

Figure 1. VAS Generator: Advanced mode

VAS provide researchers with a number of advantages. In comparison with discrete scales, measurement is more exact and the scale needs less of an explanation to participants in research (e.g. smiley face scales in studies with children). The study presented here investigates whether the VAS format diverges from the interval level or not. We will first describe the tool and its use, then test interval level of the scales.

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Generating Scales

VAS Generator greatly reduces the efforts for customizing VAS by offering a simple HTML form to modify the essential parameters in four steps.

Step 1: VAS Generator provides two modes for constructing scales. In basic mode length, color (either black or white) as well as the verbal anchors can be adjusted. The anchors can either consist of verbal material or – by inserting an appropriate snippet of HTML code like <img src="smiley.gif"> – graphical material or even sound files.
In advanced mode (see Fig. 1), the number of discrete values, width of the VAS and type of markers (cross, arrow, point or vertical line) can also be customized.
Because a VAS rating is read out as pixel number from the left end, its length equals the number of possible values (as long as one does not manipulate the number of discrete values).

Step 2: The VAS that has been generated (examples see Fig. 2) can be looked at and tested in a preview area on the same page.

Step 3: If the VAS satisfies one's needs, all basic files that are required to include the VAS on a Web page (i.e. JavaScript code, picture files and an additional instruction for offline use) can be downloaded.

Step 4: The VAS that was built in the previous steps has to be downloaded separately. After confirming the acutal parameters, the VAS is displayed in a new window. The source code for this window is downloaded by simply saving the page from the browser menu into the folder with the basic files (Step 3) and changing the file extension from ".php" to ".html".

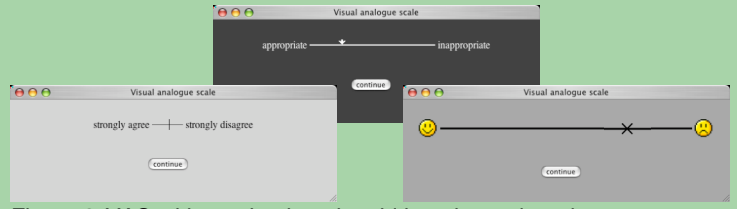

Figure 2. VAS with varying length, width, color and marker

Implementing Scales

To integrate the VAS with an existing project, the source code of the downloaded page has to be modified. Only three parameters (printed in capitals) have to be adjusted: The name of the current page ("YOUR_PAGE_TITLE") that is displayed at the top of the browser window, the name of the following page ("YOUR_NEXT_PAGE.html") and – this is most important if one uses several VAS in one survey – the name of the current scale ("THIS_VAS_NAME"). Data are automatically read out and can either be written to the server log file and/or to a database.

Empirical Test of Interval Level Measurement

To examine if VAS created with VAS Generator produce data on the level of an interval scale in Web studies, we conducted a Web experiment. 355 students were instructed to repeatedly identify 13 different values (percentages or ratios, ranging from 5% (1/20) to 95% (19/20), see Fig. 3, x-axis) in balanced order in one of three conditions: VAS length of 50, 200, or 800 pixel. Raw values were standardized to a 0 to 100 scale. On average the difference to a linear relationship was at 3.2 percentage points, ranging from 2.8 for the medium VAS to 3.9 for the shortest VAS. The average differences between 50 pixel VAS and the other length conditions were highly significant, $F(1,338)=30.13$, $p<.001$ (200 pixel) and $F(1,338)=22.21$, $p<.001$ (800). No significant difference was found between the 200 and 800 pixel conditions. For all conditions, equal numerical intervals mostly correspond to equal segments on the VAS.

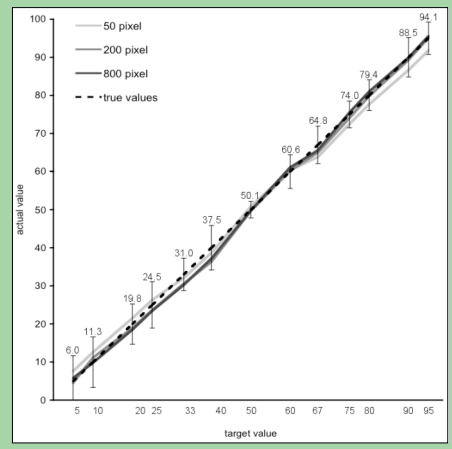

Figure 3. Target values and actual values

Conclusions

There is strong evidence that data collected with VAS are equidistant and on the level of an interval scale. Therefore, a wide range of statistical procedures can safely be applied when analyzing data measured with VAS that were created with VAS Generator. Also, equally spaced radio button scales systematically differ from interval level (Funke & Reips, 2006). The combination of these two findings implies that equally spaced radio button scales produce ordinal data only. Therewith, the measurement of the specific amount of difference between two categories (radio buttons) would not be permissible from a statistical point of view. Finally, compared to hand-coding HTML and JavaScript, VAS Generator greatly reduces the efforts needed in generating VAS for Web-based studies.

References

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