Smiley Faces: Scales Measurement for Children Assessment

Conference Paper · November 2008

CITATIONS
2

READS
14,443

2 authors:

Wan Ahmad Jaafar Wan Yahaya
Universiti Sains Malaysia
102 PUBLICATIONS **118** CITATIONS
SEE PROFILE

Sobihatun Nur Abdul Salam
Universiti Utara Malaysia
32 PUBLICATIONS **60** CITATIONS
SEE PROFILE

Smiley Faces: Scales Measurement for Children Assessment

Wan Ahmad Jaafar Wan Yahaya and Sobihatun Nur Abdul Salam
Universiti Sains Malaysia and Universiti Utara Malaysia
wajwy@usm.my, sobihatun@uum.edu.my

Abstract. *Children in early ages around 5 to 9 years old usually have a low medium capability in reading. They might not be able to read masterly and often misunderstood or missed the intended answer. In evaluation with children using questionnaire, smiley faces are used as scales for measurement as an attempt to address this problem. The main purpose of the paper is to use a suitable scale in measuring perceived motivation among children towards the usage of a persuasive multimedia learning environment (PMLE). This paper proceeds in three stages. Firstly, it begins with the conceptual of a smiley faces measurement scales for children, identifying the rationale from the children's perspective. Secondly, the Instructional Materials Motivation Scale (IMMS) with smiley faces was administered to measure the children motivation in the term of attention, relevance, confidence and satisfaction. Primary school children age between seven and nine years old are selected as respondents. Thirdly, the feedback from children and teachers regarding smiley faces measurement scales is critically appraised to identify some of its problems and limitations imposed on teaching and learning.*

1.0 Introduction

Children think and react to situation differently from adults (Preece, et al., 2006). Sitting a child down in a formal interview situation is unlikely to result in anything other than a wall of silence. This paper describes the rationale for using Smiley Faces scales and includes some examples of Smiley Faces scales that have been practiced in children measurement.

1.1 Rationale for Smiley Faces scale in children assessment

In medical field, Smiley faces scales were extensively used for measuring pain among children. Many children cannot give a verbal report of their pain, either because they are too young, or because of neurological or communication impairment.

Self-report is the "gold standard" for pain measurement (Finley, G. A., 2001). Self-report of pain is usually measured on a linear scale ranging from "no pain" to "the worst pain imaginable". Although a simple 0 to 10 numerical scale is easy to use and appropriate for adolescents and older children, just as it is for adults, younger children need alternative tools to help them deal with more abstract concepts. For the most part, these have been developed as images of faces in varying degrees of distress.

Smiley faces scale is also necessary to identify and quantify children who have dental anxiety (Buchanan, H, 2005). Justification of using the scale it should be easy to administer, score, ideal for young children, easily hold the attention of the child and be simple to score and interpret.

Indeed, in data gathering session with children, Preece, et al. (2006) stated that if children are to be included in data gathering session regardless of whatever data gathering methods used such as interviews, questionnaires, observations and others, then child-friendly methods are needed to make them feel at ease. For example, data gathering sessions need to rely on images such as Smiley Faces for very young children of pre-reading or early reading age.

1.2 Example of Smiley Faces scales

There are three examples of Smiley Faces scales given in this paper. Firstly, is the Smiley Face Assessment Scale (SFAS). It is one of a number of attitude assessment scales used primarily to measure the affective domain of children. The scale is a Likert-type self-report assessment instrument with a pictorial response system (Henerson, Morris, & Fitz, 1987 in Yang J. H., 2004). The SFAS has been adopted and used for years by the staff at Camp Koinonia, which is a one-week camp program for children with multiple disabilities in eastern Tennessee (the Knoxville area), to determine the outcome of the individual camper's camp experience. Figure 1.1 depicts the example of the Smiley Faces assessment scale used at Camp Koinonia in 1997.

Second example of Smiley faces scales is about the questionnaire specifically included questions about the child's fear towards doctors and hospital (Victorine, et al., 2004). In the questionnaire, a Likert scale is used where appropriate based on smiley faces with a score of 1-7 (1 being most afraid and 7 being most happy and comfortable).

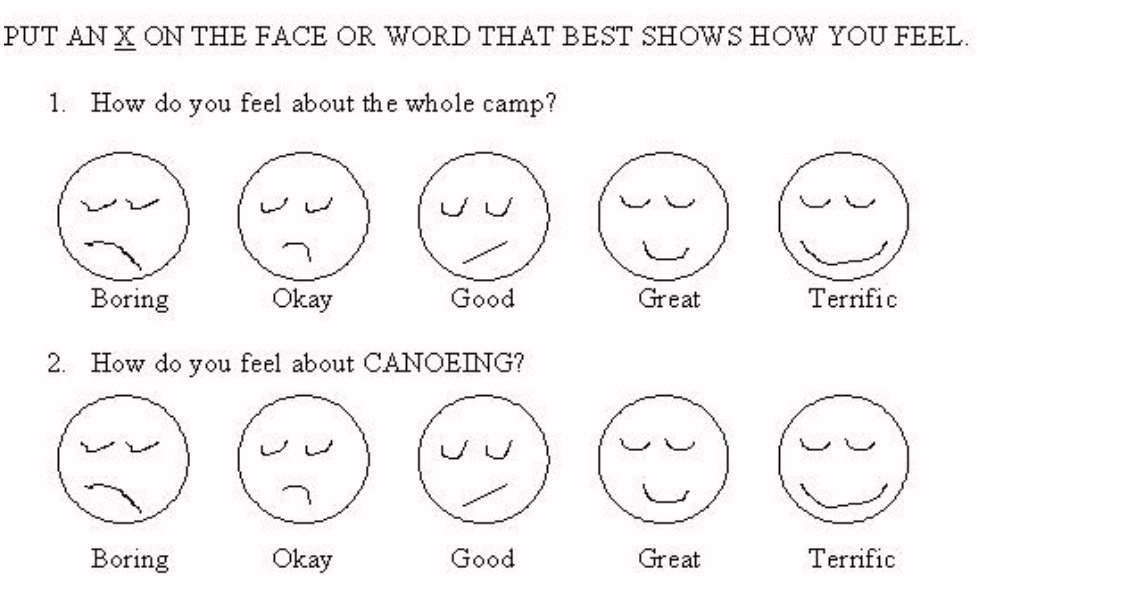

Figure 1.1 : The example of the Smiley Faces assessment scale used at Camp Koinonia in 1997 (source from Yang J. H., 2004)

Children were asked mainly about their previous experiences with doctors and hospital and how they feel about doctors and hospital before attending Teddy Bear Hospital. After attending Teddy Bear Hospital, the children then filled in part two of the questionnaire which included how they enjoy Teddy Bear Hospital, how teddy enjoyed Teddy Bear Hospital, was the child happy with what teddy doctors do to treat teddy, what they like about Teddy Bear Hospital, what they feel about doctors and hospital now and if Teddy Bear Hospital helped them at all to feel less scared. Figure 1.2 illustrates the various smiley faces to represents children fear towards doctors and hospital.

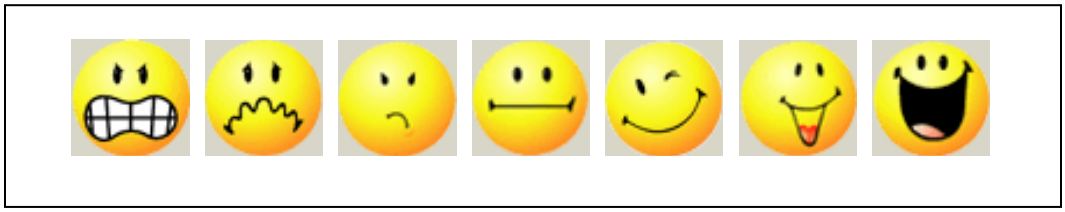

Figure 1.2: The example of the Smiley Faces assessment scale used to measure the child's fear towards doctors and hospital (Victorine, et al., 2004).

Thirdly, is about using smiley face as a scale for dental anxiety measurement in children which consisting five dimensions of children dental anxiety (Buchanan, H., 2005) The instrument is called Smiley Faces Program (SFP). All five dimensions are the major causal factors of children dental anxiety. The measurement scale for SFP is using a set of seven faces represents the feeling of children's response towards the dimensions of dental anxiety and the score ranges from 1 to 7. Hence, the minimum score possible is 4 and the maximum is 28 which higher scores indicate higher anxiety. Figure 1.3

illustrates the example of seven faces used as an assessment scale in measuring children dental anxiety.

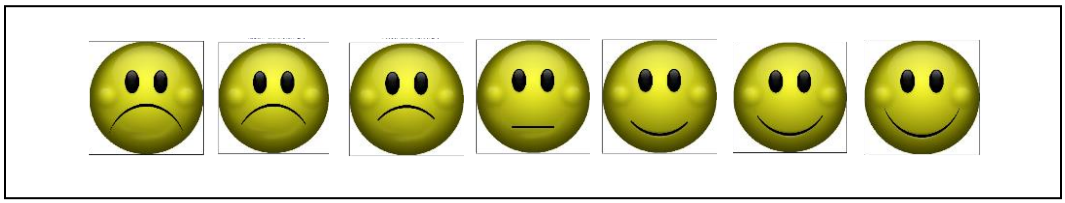

Figure 1.2: The example of seven faces used as an assessment scale in measuring children dental anxiety (Buchanan, H., 2005)

2.0 Evaluation

We have conducted exploratory study that was administered with smiley faces to measure the children motivation in the term of attention, relevance, confidence and satisfaction. A motivation test will be conducted to access the motivation level of the children in using the persuasive multimedia learning environment (PMLE). Persuasive multimedia learning environment refers to a multimedia presentation that supports the learner's construction of knowledge from a combination of different elements of media such as text, graphics, sound, animation and video on the use of computers to change attitudes and behaviors disorder. PMLE is a prototype used in this study as an attempt to reduce children dental anxiety in Malaysian population. In this study, we were not performing a motivation test although the IMMS is use to measure the motivation level among children, but instead we were trying to investigate two things. Our first research question was "do children feel the smiley faces scales help them answer the question at ease?. In this case we wanted to see whether our approach of using the set of five faces as a scale had been suitable or not, especially in helping children answering the questions correctly. Our second research question was "are children able to answer all the questions in IMMS?" For this purpose, primary school children age between seven and nine years old are selected as respondents. Instrumentation and procedures used in this evaluation are discussed further in the next sub section.

2.1 Instrumentation

The questionnaire used is Instructional Material Motivation Scale (IMMS) which was adapted from Keller (1987). The IMMS consisted of thirty six (36) items as organized into four subscales. The subscales are ARCS which are attention, relevance, confidence and satisfaction. The response using a set of five faces represents scale ranges from 1 (strongly agree), 2 (agree), 3 (neither agree or disagree), 4 (disagree) and 5 (strongly disagree). According to Keller (1993) the cronchbach's alpha reliability coefficient for each ARCS dimension were 0.89, 0.81, 0.90, and 0.96 respectively. Figure 2.0 illustrates the five faces scales used as measurement scales for assessing children perceived motivation level of the children in using the persuasive multimedia learning environment (PMLE).

Figure 2.0: Example of five faces scales used as measurement scales for assessing children perceived motivation level of the children in using the persuasive multimedia learning environment (PMLE).

The content validity of the instrument has been reviewed by the experts who are primary school teachers. Content validity reflects how well the IMMS was sampled, and the adequacy of sampling the IMMS on which people particularly children in this study are tested (Nunnaly and Bernstein, 1994). Seventeen primary school teachers were requested to review all the items constructed. The review process objectives are to ensure the constructions of the items in terms of the languages, that is suitable for the children at young age around 7 to 9 years. A revision of the instruments has been done based on the comments and opinion from the experts.

2.2 Research design

Research design for this study is using triangulation strategy which involved surveys and interviews with children who have dental anxiety feelings. Triangulation provides different perspectives and corroboration of findings across techniques, thus leading to more rigorous and defensible findings (Preece, et al., 2006). This section will discusses research design for both data gathering technique in detailed.

2.2.1 Surveys with children

The children who were involved in this exploration study are asked to use the PMLE prototype at the beginning. After they have experienced using the prototype, they will be given the IMMS in order to reflect their usage of the prototype. The teachers acted as a facilitator, monitored students and provide help if necessary. This instrument is also trying to investigate the effect towards the usage of persuasive multimedia learning environment among children. The scores from IMMS will be coded and the SPSS 11.5 for windows will be used for the analysis. The instrument will be tested for reliability by determining the Cronbach coefficient alpha which will showed that the IMMS used for this study is satisfactory reliable.

2.2.2 Interviews with children

Interviews can be thought of as a “conversation with a purpose” (Kahn and Cannell, 1957 in Preece, et al., 2006). Unstructured interviews approach which are exploratory and are more like conversations around a particular topic is employed in this study. The reasons of using unstructured interviews with children are to explore in depth their answers on the research questions. The benefits from unstructured interviews are generates rich data in giving deep understanding and clarification about IMMS instrument, and is often interrelated and complex. In addition, interviewees may mention issues that the interviewer has not considered. They will be asked questions regarding their opinions in detailed instead of assessing their motivational level through the questionnaire in IMMS surveys.

3.0 Initial Result

These initial results are based on qualitative comments made by children after the evaluation. Regarding our first research question, we were first looking whether smiley faces scales help them answer the question at ease. Throughout the evaluation, children found that the five faces as the answering choices are quite difficult in choosing the outstanding answer for the particular question. The justification made was the two choices for both sad faces and happy faces are slightly same. Because of this, the children were having difficulties to choose which correct faces that will represent their correct answer. This result is being agreed by the teacher who had review the IMMS.

Regarding our second research question, all children were able to answer all the questions in IMMS. However, teachers who have conducted the motivation test commented that the number of questions in IMMS is too long for the children to answer.

4.0 Recommendations and conclusion

We have adapted the smiley faces scales into IMMS instrument for children. Our strategy is to help children answer the question easily and enjoyably. The results of exploratory study with children and teacher found the five faces scale are not suitable to represents the correct answers towards the questions given. We suggest modifying the five faces scales with the clear option of different facial expression for each faces such as the example of the Smiley Faces assessment scale used by Victorine, et al. (2004).

Teacher also commented IMMS comprises too long questions for children to answer. The longer questionnaire comprises 36 questions, using combinations of responses from several items to provide scale scores for five dimensions of satisfaction. The rationale of using long questions are, respondents are asked to agree or disagree with a series of similar statements phrased in different ways, with some worded positively and some worded negatively. The claimed advantages of questionnaires of this type are that multi-item scales provide more reliable findings and a greater distribution of responses to capture different degrees of satisfaction. However, people sometimes give clearly inconsistent responses, or omit question items, possibly because they are confused or irritated by being repeatedly asked similar questions in different ways. These inconsistencies will lead to a greater distribution of responses which does not necessarily indicate greater reliability. In addition, the lower response rate from a longer questionnaire means that any gain in sensitivity and reliability may be at the expense of a loss of representativeness.

Teacher suggested that the IMMS should be modified in a short questionnaire. It is because the participant is involved with children who have moderately low retention rate. This is in line with advantages of short questionnaire from Bullock, B and Tenenbein, M (2002), as well as a slightly higher response rate, it offers ease of administration and data entry and is useful when it is necessary to incorporate questions about satisfaction within a longer questionnaire which addresses other issues as well. As anticipated, the short questionnaire in their study had the disadvantage of marked ceiling effects (high satisfaction scores on most questions).

Future works includes a modification of smiley faces scales in current IMMS and a follow- up study where the on-going evaluation will be done throughout the study for a long term.

References

Buchanan, H. (2005). Development of a computerized dental anxiety scale for children:validation and reliability, *British Dental Journal*, 199, 359-362.

Bullock, B and Tenenbein, M. (2002). Validation of 2 Pain Scales for Use in the Pediatric Emergency Department.

Finley, G. A. (2001). How much does it hurt? Pediatric pain measurement for doctors, nurses, and parents. *Canadian Journal of Anesthesia* ,48: R4.

Keller, J.M. (1987). Development and use of the ARSC model in instructional design. *Journal of Instructional Development, 2(4), 26-34.*

Nunnally, J. C. & Bernstein, I. H. (1994). *Psychometric Theory*. McGrawHill, USA.

Preece, J., Rogers, Y., & Sharp, H. (2007). *Interaction design: beyond human-computer interaction*. (2nd edition). England: John Wiley & Sons.

Victorine, A., Wong, Z.Y. and Geilani, J. (2004). Teddy Bear Hospital (TBH) – reducing children's fear of doctors and hospital environment. *PEDIATRICS Vol. 110 No. 3* September 2002, pp. e33.

Yang, J.H. (2004). Establishing the Reliability of The Smiley Face Assessment Scale: Test-Retest .