A framework for defining how acceptable is acceptable: A threshold for subjective data

Sheena Care

LAND Division, Defence Science and Technology Organisation (DSTO), Australia

1. Introduction
Acceptability rating scales (ARSs) are commonly used as a subjective data collection method for human factors evaluations of Australian Defence Force clothing and soldier borne equipment. There are two issues presented by the current use of ARSs. The first is that there is no standardised method for selecting an ARS; therefore scale selection is at the discretion of the individual researcher. The second issue is that ARSs have not been sufficiently validated in the military context.

Currently, definitions based on mission performance and impact on health are used in ADF clothing and soldier borne equipment assessments. However, the extent to which respondents use and agree with these definitions is not well understood. Additional qualitative data is heavily relied on to interpret the ARS data; however, a better understanding of how soldiers interpret acceptability is required to appreciate the practical implications for human factors equipment evaluations. For example, if a piece of equipment is rated as slightly unacceptable, how does this rating relate to user’s operational performance, tolerance for the equipment, and their perceived level of risk? To understand this, this presentation presents an initial investigation into the factors that should be considered when selecting an acceptability rating. This work will help define a framework for the selection of an appropriate subjective assessment tool that can be applied in various domains, while considering influential factors such as the intention of the assessment.

2. Method
A literature review is currently being performed to explore the concept of acceptability generally. This is focused on what influences individuals to make judgements, and factors that influence military personnel specifically. Identified ARS in the literature are being reviewed focussing on development, use, and validation methods. The presentation will provide preliminary results for this work.

3. Results
Preliminary results show that the interpretation of acceptable differs across English speaking civilian populations, for example the Collins dictionary [Collins Dictionary, 2014] provides a different definition between the UK and America. There are also differences in what is likely to be considered acceptable across cultures, i.e. Individualistic, vs Collectivistic cultures [Harkness, et al., 2010] are likely to interpret acceptability differently.

No military specific studies were found regarding the interpretation of acceptability. Most civilian studies measured user acceptance by using a scale of agreement for several dimensions, which tend to define acceptability specifically to the experiment. Measuring preference compared to acceptability on a 9-point bipolar scale have shown that the minimal preferred position does not correlate well with the minimum acceptable limit on an ARS [Ceuvorst, et al, 2012, Manning, 1999].

4. Discussion
As differences are seen across civilian populations, it is likely that differences will also be seen across Army populations. It may be the case that aspects of both individualistic and collectivistic cultures are present within the Army, which would likely elicit a response bias. Given that survey respondents are commonly drawn from one unit due to availability, it is important to understand if these groups are a truly representative sample. There is the possibility that response bias is present in specific groups, and will need to be controlled for. It is also likely that the use of different wording on various scale types may elicit different results, so this needs to be explored with currently used ARSs.

The tolerance limits were defined for a bipolar scale, in a very specific context; this will need to be validated in the military context for both bipolar and unipolar ARSs. This is important because depending on the words used on a scale, the implications for what is considered tolerable may vary. It is likely that military
respondents consider more aspects than health and mission performance when making an acceptability judgement. It may be the case that health and performance are the most predominant factors considered by soldiers, and therefore factors considered in a civilian population may not register as important. It is also possible that more aspects than these are considered as important. In any case, this needs to be further explored.

Military specific data collection is planned for the next phase of this study, to consider all the intricacies involved with acceptability judgement in the context of equipment evaluation considering operational environments, and fill the gaps in knowledge found in the literature review.

Keywords
Acceptability, rating scale, Military, Equipment evaluation, Subjective data

References