Perception problems of the verbal scale

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ABSTRACT

Many forensic scientists use a verbal scale to describe the significance or weight to be attached to their opinion. Although there is a considerable amount of work in the field of psychology regarding people's perception of quantitative descriptors such as those used in the verbal scale, there has been no published work relating to the use of such descriptors in a forensic context. Our aim was to assess the extent to which the verbal expressions used by the expert in court are perceived and the extent to which they are differentiated by potential jurors. Four hundred volunteers were asked to indicate the level of strength they perceived from the use of the verbal scale characters within excerpts from purported expert witness statements. Although preliminary, these results show that there are serious misunderstandings of the verbal scale. It does not achieve the purpose for which it was created. The terms used are unlikely to be understood properly by lay people and it would appear that they are actually misunderstood.

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1. Introduction

Many forensic scientists use a verbal scale to describe the significance or weight to be attached to their opinion. The UK Association of Forensic Science Providers (AFSP) specifically requires the use of a likelihood, or Bayesian approach, often in conjunction with a verbal scale [1].

"This is the expression of the extent to which the observations support one of the two competing propositions. [Prosecution and opposing Defence] The extent of the support is expressed to the client in terms of a numerical likelihood ratio (where sufficiently robust data is available) or a verbal scale related to the magnitude of the likelihood ratio when it is not."

There are many evidence types where it is not possible to calculate a numerical likelihood ratio. It is accepted that assigning magnitude to a likelihood ratio which has not been calculated through numerical statistical assessment is not ideal, as Berger et al. state, "*there is much scope for improvement*" [2]. However, as Martire et al. have pointed out that the scale is 'untested and unvalidated' [3].

At the moment, however, it is the compromise routinely adopted for the task of using simple, standardised terms to relate to a court the strength of scientific evidence. Berger et al., therefore, endorse the use of the verbal scale and state that,

"Forensic scientists have always recognised the desirability of maintaining some sort of consistency of language between experts, disciplines and organisations; this, in turn, inspires the wish to standardise, as far as reasonable, on a small number of qualifiers."

Aitken et al. [4] are also definitive;

"A verbal scale based on the notion of the likelihood ratio is the most appropriate basis for communication of an evaluative expert opinion to the court. It can be phrased in terms of support for one of a pair of clearly stated propositions."

These in fact address two different, but connected, matters: the opinion on the strength of evidence as decided by the expert, and the accurate understanding of that strength by the Court. We have examined the latter and raise questions about the former.

The presentation of evaluative opinion in a manner that fairly presents the weight of evidence to a court is a complex topic. Even the term 'evaluative opinion' has been defined differently by experts ("An Evaluative opinion is an opinion based upon the estimation of a likelihood ratio") and by courts (The Court in *R v T* [5] drew attention to the use of an evaluative opinion in the cases of *Reed & Reed* [6] and *R v Weller*: "In neither case was there any question of a statistical basis or the use of a likelihood ratio" [7]). More recent cases, such as *R v Dlugosz* [8], have opened the door to an opinion being expressed by the expert not only absent statistics but also using whatever quantitative term the expert prefers ("In our view, an expert is not bound to

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express an evaluative opinion by reference to the hierarchy; he can use other phrases." *Dlugosz*, para. 14). It is therefore timely to consider the issue of how an expert is to convey effectively their opinion of the weight of evidence to the court.

It has been acknowledged that juries have difficulty in comprehending the magnitude of numerical evidence, particularly when it involves very large numbers [9]. One suggestion was that these figures could be simplified to smaller everyday numbers using logarithms, and perhaps having a verbal scale associated, which tried to depict this number in terms of for example the size of a family, population of a town, up to the population of the world [9]. The use of a verbal scale is intended to simplify the evidence interpretation to enable a jury of lay public to comprehend. There are various forms of verbal scales but that which has been adopted by a large number of forensic practitioners, Fig. 1, is the scale generally used in UK courts to relate the strength of the evidence by the level of support it provides for a particular hypothesis. The problem with this compromise is that it has not been demonstrated to be effective. It is not known whether the verbal scale is correctly understood by jurors. As Martire et al. state,

"Yet few, if any, in the forensic sciences have explicitly considered whether the proposed logically and scientifically appropriate form of testimony is also a valid and reliable means of conveying the intended value of the information to jurors."

It should be noted that the Appeal Court in *R v Atkins & Atkins* [10] stated,

"We think it preferable that the expressions should not be allocated numbers … lest that run any small risk of leading the jury to think that they represent an established numerical, that is to say measurable, scale."

Despite this, some experts still include this scale (or something similar) in their reports even when the opinion has no numerical foundation.

Berger et al. [2] cite three key questions:

1. How common is the evidence if the main proposition were true?
2. How common is the evidence if the alternative proposition were true?
3. In which of the above cases is the evidence more likely? The asymmetry between both assessments provides the weight of the evidence.

Berger et al. point out that the importance of assessing these three questions should be addressed by the trial judge in their guidance to the jury. Although it may require a scientific expert to provide the answers to the first and second questions, the weight of the evidence should become apparent from these. For the expert to provide the assessment without explanation deprives the jury the opportunity to gauge the weight of the evidence. Rather, it is expected that the jury or Court can understand the weight of the evidence through
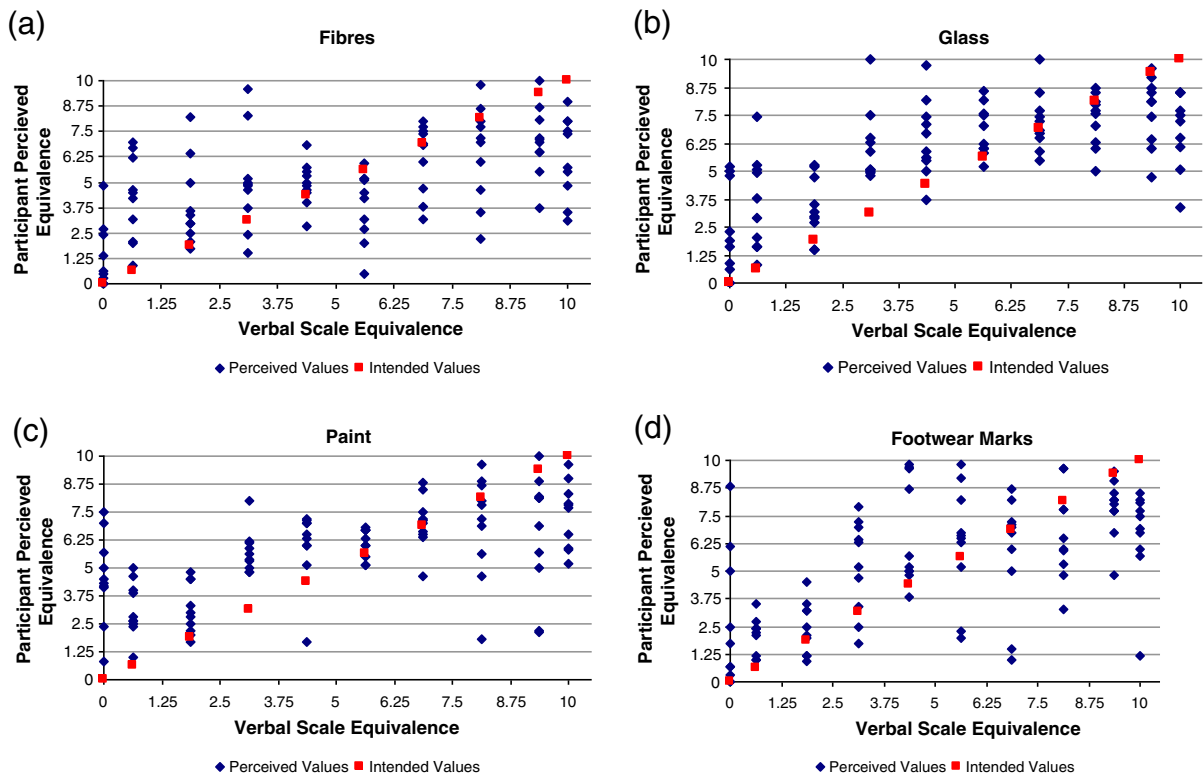

Fig. 1. Verbal descriptions of likelihood ratios. These are not fixed values but intended to be a guide to the judgement of the scientist which can extend to personal certainty "conclusive" in cases which do not involve DNA.

Likelihood ratio (LR)	Verbal interpretation of support
>1 to 10	Limited
10 to 100	Moderate
100 to 1000	Moderately strong
1000 to 10,000	Strong
>10,000	Very strong
1 million or more (exclusive to DNA analysis)	Extremely strong.