



USING QUALITATIVE TERMS IN THE STANDARD GAMBLE A PILOT STUDY

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INTRODUCTION

The healthcare environment is becoming increasingly complex.

- Sophisticated diagnostic information
- Multiple treatment options
- Conflicting recommendations
- Greater patient role in management decisions

Patients are being asked to weigh the risks and benefits associated with treatment options and make choices that reflect their individual preferences.

Expected utility decision making and cost-effectiveness analysis require the assessment of health-related utility. Preferred methods of utility assessment include the standard gamble and time tradeoff; both methods place high cognitive demands on the respondent.

The validity of a utility score may be threatened by the subject's health numeracy skills. People who lack basic numeracy skills may be unable to respond in a manner that reflects their true strength of preference for a health state.

Here, we define *health numeracy* as the degree to which individuals have the capacity to access, process, interpret, communicate, and act on numerical, quantitative, graphical, biostatistical, and probabilistic health information needed to make effective health decisions.

One study (Schwartz, McDowell, Yueh, 2004; Head & Neck) showed that utility scores in head and neck cancer patients were affected by the patients' numeracy skills.

In this study, we pilot-tested a new approach to the standard gamble (SG) that uses qualitative rather than quantitative descriptions of probability. Of interest is whether differences between the qualitative and quantitative standard gamble formats can be explained by differences in numeracy skills.

SUBJECTS

87 undergraduate students taking a business class
21 years of age on average
52% Male
82% White, 12% Black, 6% Other
Most were enrolled in non-business majors w/o rigorous math requirements

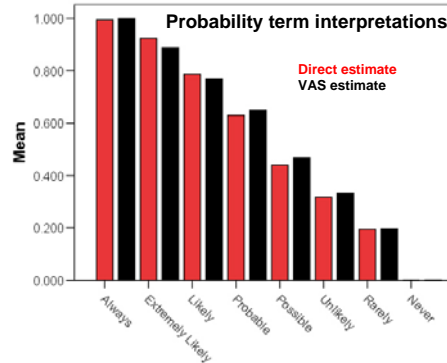
METHODS

Subjects rated the utility of oropharyngeal (throat) cancer using two forms of the paper standard gamble.

Probability of perfect health or death was presented:
Quantitatively ("80% chance of cure")
Qualitatively ("Treatment is likely to be successful")

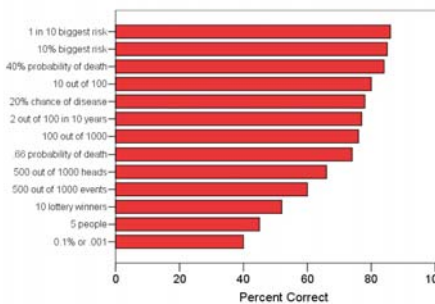
Qualitative gambles were constructed using the terms: **always, extremely likely, likely, probable, possible, unlikely, rarely, and never.**

Subjects assigned numerical values to the qualitative terms directly and with visual analog scales (VAS). These numerical values were then used in the determination of the utility.



Numeracy was measured with an extended Lipkus numeracy survey (Lipkus, Samsa, Rimer, 2001; Med Dec Making). Two items were added to test knowledge about the additivity principle of mutually exclusive events.

Lipkus Numeracy Scale (Extended)



Qualitative and Quantitative Standard Gamble

Imagine that you have had a sore throat for the past two weeks and the pain from the sore throat lasts all day. The sore throat has made it difficult to swallow, made eating very painful, and your voice to sound hoarse. Along with experiencing a sore throat, you have had pain in both ears that makes hearing difficult. This morning, you noticed blood in your mouth. The blood appears to be coming from your throat.

You visited a doctor who thinks that you have Oropharynx cancer (cancer of the mouth and throat). A new (make believe) pill is now available for your condition.

Your doctor advises you that if you take the pill today and it works it cures every problem you currently have for the rest of your life. However, if you take the pill today and it does not work it will cause you to die suddenly, but painlessly, tonight in your sleep. Your doctor has no way of predicting which patients will be cured by this new (make believe) pill, and will support whatever decision you make. If you choose not to take the pill, your health will remain as we described it above - it won't worsen or improve for the remainder of your life.

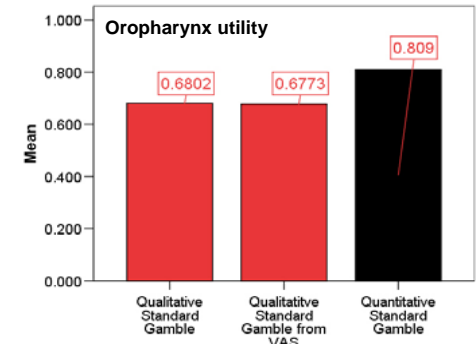
We want to know what you think about this pill.

Would you take the pill right now if you knew ... (Please circle yes or no for all questions)

Would you take the new (make believe) pill if your doctor said the treatment is always successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is extremely likely to be successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is likely to be successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is probable to be successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is possible to be successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is unlikely to be successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is rarely successful.	YES	NO
Would you take the new (make believe) pill if your doctor said the treatment is never successful.	YES	NO

Would you take the pill right now if you knew ... (Please circle yes or no for all questions)

... it had a 100% chance of cure and 0% risk of causing immediate death?	YES	NO
... it had a 99.5% chance of cure and a 1 in 200 (.5%) risk of causing immediate death?	YES	NO
... it had a 99.2% chance of cure and a 1 in 250 (.4%) risk of causing immediate death?	YES	NO
... it had a 99.2% chance of cure and a 1 in 125 (.8%) risk of causing immediate death?	YES	NO
... it had a 99% chance of cure and 1% risk of causing immediate death?	YES	NO
...	YES	NO



RESULTS

Utilities derived using the quantitative SG and qualitative SG were significantly correlated ($r=.41$, $p<.0001$)

Mean utilities estimated with the quantitative SG ($M=.81$, $SD=.18$) were significantly higher than those estimated with the qualitative SGs (direct estimation, $M=.68$, $SD=.23$; VAS estimation, $M=.68$, $SD=.22$). The qualitative utilities derived from direct estimation or the VAS were not statistically different.

Differences between the quantitative (direct estimation, $r=.04$; VAS estimation, $r=.02$) and qualitative utilities were unrelated to the subject's numeracy score.

On average, subjects answered nearly 80% of the numeracy questions correctly.

CONCLUSIONS

Overall, subjects were highly numerate and demonstrated, via direct estimation and the VAS method, a consistent understanding of the qualitative probability terms.

When given the opportunity to choose between gambles in which their own subjective interpretations served as the index of risk, subjects took higher risks (i.e., had lower utilities) than they did when the risks were presented numerically.

Additional qualitative terms may be necessary to allow subjects to provide more precise estimates of their utility for the health state. An ongoing study is expanding the list of probability terms to 20 in order to match the number choices the decision maker has on the quantitative gamble.

A standard gamble that is accessible to individuals with low numeracy skills will be useful for advancing the field of medical decision making.

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