ent nature of these two factors jeopardises the meaning and interpretation of QALYs. METHODS: A simple general linear transformation of the utility scale suffices to demonstrate that the results of the multiplication are not invariant. RESULTS: Mathematically, the solution to these limitations happens through an alternative calculation of QALYs by means of operations with complex numbers rooted in the well known Pythagorean theorem. CONCLUSIONS: Through a series of examples, the new calculation arithmetic is introduced and discussed.

**Linguistic Validation of the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) in 24 Languages**

OBJECTIVES: Measuring enjoyment and general satisfaction of individuals in an international clinical trial involving 24 languages required the linguistic validation of the 93-item QoL Enjoyment and Satisfaction questionnaire. The original US English questionnaire is divided into 10 sub-scales: general activities, global satisfaction, household duties, leisure time activities, physical health, satisfaction with medication, school and course work, social relationships, subjective feelings and work. METHODS: The translation process was conducted by a specialist in each target country using the following methodology: 1) two forward translations by professional translators, native speakers of the target language and fluent in English; 2) comparison and reconciliation of the translations by the specialist in the target country and the translators; 3) backward translation by a native English speaker; 4) comparison of source and backward version; 5) comprehension test on 6 healthy individuals and review by one clinician; and 6) international harmonisation to check international comparability of translations. RESULTS: Linguistic and conceptual issues emerged when translating idiomatic English phrases and the response categories. The comprehension test showed difficulties understanding the original question “how satisfied have you been. . . .” in conjunction with a response scale entitled “overall satisfaction” followed by the answer choices: very poor, poor, fair, good, very good”. To facilitate the link with the question the translations used “very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, very satisfied.” Also, the original “do the banking” was problematic as in some countries it is not common to have a bank account. Translations referred to “manage everyday financial matters”. CONCLUSION: The 24 language versions were established according to a rigorous process to ensure conceptual equivalence and cross-cultural acceptability of translations to facilitate the international comparison and pooling of data. Psychometric testing will be conducted to ensure the reliability and validity of each translation. This work highlights the importance of receiving international feedback on a questionnaire before finalising it in 1 language.

**Benefits of Translatability Assessment to Enhance the Coherence of Data in International Studies—the IQOD Experience**

OBJECTIVES: To evaluate the cross-cultural equivalence of PRO measures and their translations the IQOD programme—the international Health-Related QoL Outcomes Database—selected three questionnaires. Although classical psychometric methods used for the evaluation of the Psychological General Well-Being Index (PGWBI) reflect systematic replications of results across the 17 translations, tests of differential item functioning (DIF) for mental health as latent variable failed for several languages and item response theory (IRT) tests for all languages. A reason for this is the co-existence of 20 different 6-point response categories investigating frequency and intensity for the 22-item questionnaire making mistranslations and the introduction of confounding constructs possible. A revision of the original formulations in terms of an analysis of their translatability before the creation of language versions could have avoided this issue. METHODS: A translatability assessment can be defined as an international critical review of a pre-final original in collaboration with the developer. In the absence of international development, this may be a cost- and time-effective alternative to the WHO approach to instrument design. As the translation process reveals difficulties when adapting concepts, idiomatic expressions, response scales, format, instructions and demographic items, these aspects are reviewed and items re-formulated taking the constraints of other cultures into account. RESULTS: Several examples of the impact of translatability assessment on the PGWBI will be given. Most importantly, had the process been conducted prior to translation and testing the 14 response scales investigating intensity could have been reduced to 1 and the 2 response scales investigating frequency could have also been reduced to 1. The total number of response scales could have been reduced from 20 to 3, thus facilitating translations and ultimately DIF and IRT tests results. CONCLUSION: Translatability assessment may be a practical way to incorporate international input into instrument development, thereby facilitating subsequent translation and ultimately the coherence of international data.