

Theory / Review

The Challenges of Translating the Clinical Outcomes in Routine Evaluation–Outcome Measure (CORE-OM) Into British Sign Language

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This article discusses translation issues arising during the production of a British Sign Language (BSL) version of the psychological outcome measure “Clinical Outcomes in Routine Evaluation–Outcome Measure” (CORE-OM). The process included forward translation, meeting with a team of translators, producing a second draft of the BSL version and back translating into English. Further modifications were made to the BSL version before piloting it with d/Deaf populations. Details of the translation process are addressed, including (a) the implications of translating between modalities (written text to visual language); (b) clarity of frequency anchors: analog versus digital encoding; (c) pronouns and the direction of signing; and (iv) the influence of the on-screen format. The discussion of item-specific issues encountered when producing a BSL version of the CORE-OM includes the expression of precise emotional states in a language that uses visual modifiers, problems associated with iconic signs, and the influence of Deaf world knowledge when interpreting specific statements. Finally, it addresses the extent to which lessons learned through this translation process are generalizable to other signed languages and spoken language translations of standardized instruments. Despite the challenges, a BSL version of the CORE-OM has been produced and found to be reliable.

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Purpose of the Study

This study focuses on the challenges that arose in the translation and standardization of the Clinical Outcomes in Routine Evaluation–Outcome Measure (CORE-OM) into British Sign Language (BSL) for use with Deaf¹ people. The CORE-OM (Evans et al., 2000, 2002) is a widely used outcome measure that measures changes in mental health (Barkham et al., 1998). It is routinely used as an initial outcome measure of well-being and to measure treatment outcomes for individual patients, as well as to audit and evaluate outcomes of mental health services in the United Kingdom (Barkham et al., 1998). Shortened forms, for example, the CORE-10, are available (Barkham et al., 2012). Prior to this study, although the CORE-OM was being used with Deaf people in mental health services, there was no single translation into BSL that was common across services, nor was there any translation in use whose reliability had been tested with a population of Deaf BSL users. The results of the pilot testing of the BSL CORE-OM, its reliability, and validation are reported elsewhere (Rogers, Evans, Campbell, Young, & Lovell, 2013a). The focus of this article is the translation methodology used, the challenges identified in working from a written language (English) into a signed language (BSL), additional

issues that arise from the highly structured nature of self-report measures, and the lexical domain of the instrument that includes precise distinctions in the expression of emotion, mental states, and self-awareness.

Rationale of the Study

Outcome measures are widely used in clinical practice and research (Jackson & Furnham, 2000) and can be norm-referenced so that an individual's score can be compared with scores from others in the same population (Aiken & Groth-Marnat, 2006). Norm-referencing process relies on establishing how a given population performs on a measure in order to establish the normal distribution of scores, with means and standard deviations, within that population (Coaley, 2009). However, these cannot be established unless one can be sure that the instrument used is linguistically and culturally matched to the population that will be measured by it. Although it is perfectly possible to create bespoke instruments for given language and cultures, it is far more common to translate instruments whose properties are already established and then test the reliability of the translated version. Despite the substantial challenges in translating measures from one language to another, having an outcome measure translated rather than developing a new one can be beneficial: it is cheaper and quicker, allows for comparison between populations, and enables people to do the outcome measure in their preferred language (Hambleton & Patsula, 1998).

The translation of a standard instrument needs to be understood and be meaningful to the target population in terms of the concepts it uses and how they are expressed (Todd & Bradley, 1994). Cultural norms are associated with language use but not defined by them. Simply translating into another language does not ensure cultural equivalence (Lim & Firkola, 2000). Language used to describe the same concept can vary by culture (Nolan, 2005). For example, El-Rufaie and Absood (1987) translated the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) from English into Arabic. However, it became clear on empirical testing of the translation that there is no phrase indicating anxiety corresponding to the English "butterflies in the stomach." Although linguistically accurate, the translation

resulted in a nonsense item. El-Rufaie and Absood (1987) also note that there are no words in Arabic strictly corresponding to the English words "anxiety" and "depression." Vocabulary alone does not show how one perceives or makes sense of an actual word and effort is required to find ways of getting a particular concept across when translating a measure, even if there is no word corresponding to that used in the source instrument in the target culture (Nolan, 2005).

The translated version of an instrument also requires standardization within the target population; Aiken and Groth-Marnat (2006) state that the main purpose of standardization is establishing the norm so that individual scores can be compared with it. This usually entails piloting the translated version with a sample from the target population and examining the psychometric properties of the translated instrument based on their scores. However, these tests of a translated measure are separate from, and can only come after, good translation.

There are basic guidelines for translating a *standard instrument* (Brislin, 1970; Hambleton, 1994; International Test Commission, 2010; Muniz & Bartram, 2007; Wild et al., 2005). Process is important because problems with process could contribute to translation errors (Solano-Flores, Backhoff, & Contreras-Nino, 2009). A basic approach involves initially translating from language A into language B, then a different person using the translated version carries out a back translation from language B into language A (version A1). Finally, the equivalence of the meanings of versions A and A1 are compared. If the process fails to achieve equivalent meanings between the original version (source language) and the back-translated version, then the translation is considered inadequate. Brislin (1970) emphasizes that familiarity with the subject area of the instrument will lead to more accurate translation, known as content effect, but translation by too specialist a team can lead to a wording in the target language that is not understood by significant numbers of lay people. Effective translation requires cultural knowledge, not just linguistic or subject-specific knowledge (Forsyth, Kudela, Levin, Lawrence, & Willis, 2007).

Worldwide, there is a dearth of valid and reliable outcome measures that have been effectively translated

into signed languages and normed with Deaf populations (Samady et al., 2008). Although there has been an increasing interest in signing standard outcome measures for use with Deaf people via an interpreter (e.g., Wilson & Wells, 2009), this is different from producing a translated version with reliability and validity checked within the population where it will be used. Mental health outcome measures in signed languages for Deaf populations are important because of the high prevalence of mental health difficulties in Deaf populations (Fellinger, Holzinger, & Pollard, 2012; Hindley, Hill, McGuigan, & Kitson, 1994). Prior to the start of this study, the only available reliable BSL mental health measure was the BSL version of the Trait Emotional Intelligence Questionnaire (Gascon-Ramos, Young, Petrides, Stone, & Woolfe, 2010). Since this study, other BSL mental health outcome measures have been produced including the Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder 7-Item Scale (GAD-7), and the Work and Social Adjustment Scale (WSAS; Rogers et al., 2013b). Other mental health measures have been translated into other sign languages, such as the Rosenberg Self-Esteem Scale into American Sign Language (ASL; Crowe, 2002), the Multidimensional Health Locus of Control into ASL (Samady et al., 2008), and the 12-item General Health Questionnaire into Austrian Sign Language (Fellinger et al., 2005).

In what follows, we discuss the process of translation we used. We highlight 11 translation issues that arise specifically with respect of translating from a written into a signed language and seeking a cultural equivalence, within the constraints of a standardized outcome measure. We consider their generalizability to other translation tasks involving Deaf people. The psychometric properties of the BSL CORE-OM are reported elsewhere (Rogers et al., 2013a).

Methods

Clinical Outcomes in Routine Evaluation–Outcome Measure

The CORE-OM measure of global distress contains 34 items covering four domains: well-being, commonly experienced problems or symptoms, life or social functioning, and risk (to self and others). There are five response options for each item, which in the English

version are as follows: “Not at all,” “Only occasionally,” “Sometimes,” “Often,” and “Most or all the time” (See Figure 1 for an example of the CORE-OM English version). It has been validated with the general population as well as with users of primary and secondary mental health services (Evans et al., 2002). It has been translated into more than 20 other written languages, including Italian (Palmieri et al., 2009), Slovak (Gampe, Biešcad, Balúnová–Labanicová, Timulák, & Evans, 2007), Portuguese (Sales, Moleiro, Evans, & Alves, 2012), and Swedish (Elfström et al., 2012).

Translation Procedure Used for This Study

The translation of the English version of the CORE-OM into BSL followed the same procedure as the one outlined by Evans (2008) for translation between written languages, with additional consideration given to issues arising from the modality (signed, not written) and grammatical properties of a visual, gestural, and spatial language.

First stage. Five Deaf people bilingual in written English and BSL, from different professional backgrounds, each carried out a forward translation from English into BSL (first draft). They received information explaining the purpose of the study. The rationale for selecting people with a variety of professional backgrounds for the forward translation was to incorporate their potentially differing perspectives on the meaning of the statements in the CORE-OM. The five consisted of three women and two men: one Deaf qualified BSL/English interpreter, one Deaf clinical psychologist, one Deaf mental health support worker, and two lay Deaf people. Each did a forward translation of the CORE-OM into BSL, which they filmed individually, their translations being stored on video.

Second stage. During the second stage, the first author [K. D. Rogers] and one of the people involved in the creation of the original outcome measure tool, Chris Evans, met with the group of forward translators. The group examined each of the five BSL versions created by the Deaf translators in the first stage. Together, they reviewed the differences between BSL versions, item by item. Discussions included clarifying the

IMPORTANT - PLEASE READ THIS FIRST

This form has 34 statements about how you have been **OVER THE LAST WEEK**.
Please read each statement and think how often you felt that way last week.
Then tick the box which is closest to this.
Please use a dark pen (not pencil) and tick clearly within the boxes.

| Over the last week | | Not at all | Only Occasionally | Sometimes | Often | Most of all the time | OFFICE USE ONLY |
|--------------------|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|--------------------|
| 1 | I have felt terribly alone and isolated | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | F |
| 2 | I have felt tense, anxious or nervous | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | P |
| 3 | I have felt I have someone to turn to for support when needed | <input type="checkbox"/> 4 | <input type="checkbox"/> 3 | <input type="checkbox"/> 2 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | F |
| 4 | I have felt O.K. about myself | <input type="checkbox"/> 4 | <input type="checkbox"/> 3 | <input type="checkbox"/> 2 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | W |
| 5 | I have felt totally lacking in energy and enthusiasm | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | P |
| 6 | I have been physically violent to others | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | R |
| 7 | I have felt able to cope when things go wrong | <input type="checkbox"/> 4 | <input type="checkbox"/> 3 | <input type="checkbox"/> 2 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | F |
| 8 | I have been troubled by aches, pains or other physical problems | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | P |
| 9 | I have thought of hurting myself | <input type="checkbox"/> 0 | <input type="checkbox"/> 1 | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | R |

Figure 1 Example of the Clinical Outcomes in Routine Evaluation–Outcome Measure (CORE-OM) English version.

meaning of specific items in English and using this as a reference point for the identification of the preferred BSL version. Contemporaneous notes were taken of the discussion points, which were also filmed, for later reference. Where useful, Chris Evans was asked why items were phrased as they were in the English version and options in BSL were explained to him to see whether decisions that had led to the version in written English would help choose the best option in BSL.

Third stage. This process resulted in the production of an agreed BSL version of the CORE-OM by one of the members of the forward translators team (second draft).

Fourth stage. The agreed second draft of the BSL version was translated back into English by two Deaf individuals independent of the study. They had not seen the original written English version or the first

draft of the BSL version. In parallel, five BSL users were asked to complete the CORE-OM BSL, to check whether they had any difficulties with it. Any points raised, including requests for clarification, comments on the style of signing, or choice of specific signs, were noted.

Fifth stage. Feedback from the back-translation team and the five people completing the BSL CORE-OM was considered in detail, comparing the back translators' comments and checking the original English version, as well as looking back to the BSL version. Further modifications were made to some of the BSL items. These steps led to the production of the final version of the CORE-OM in BSL, ready to be piloted. All major changes through Stages 3–5 were explained to Chris Evans to provide quality assurance on the translation process for CORE System Trust².

Data Collection Using the Final Draft of the BSL CORE-OM

The BSL CORE-OM was piloted using an online version whereby participants watched each item in BSL and clicked a response (See [Figure 2](#) for an example of the BSL version of the CORE-OM in the survey tool). The survey tool on the computer showed the BSL version of each CORE-OM item individually per screen page. A detailed description of the Web site hosting the BSL CORE-OM can be found in the study by [Rogers et al. \(2013a\)](#). Data were encrypted and uploaded to secure storage. For full details of the piloting process, see [Rogers et al. \(2013a\)](#). Previous studies have used similar techniques ([Fellinger et al., 2005](#); [Graybill et al., 2010](#); [Montoya et al., 2004](#)). Subtitles were not included in order to establish the reliability of the BSL version without the influence of written English.

Translation Challenges

The following discussion on specific translation challenges and how they were resolved is based on an analysis of notes produced from the forward translators' initial meeting; observations of the difficulties in equivalence identified when the forward and back translations were

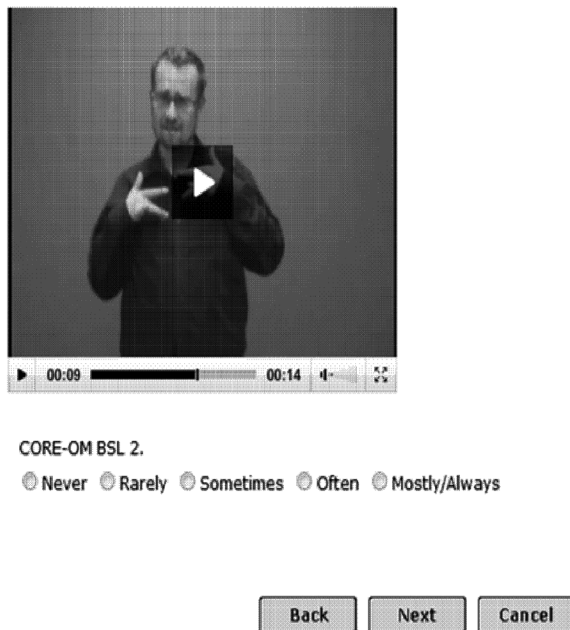


Figure 2 Example of the British Sign Language (BSL) version of the CORE-OM in the survey tool (shown in SelectSurvey.NET software implementation).

compared; and the discussions between translators, the originator of the standard instrument, and the first author (K. D. Rogers).

General Issues

Implications of modality. The BSL CORE-OM involved translating between languages and between modalities. The original is in a written form, whereas the BSL version, accessed online, is in a visual form. This shift in modality had implications for some very basic issues about the administration of the instrument, for example, the initial instructions. The instructions in the English CORE-OM use the word “statement” when referring to each of the items. This would not make sense in BSL because participants would not read a statement but instead would be watching a signer for each item. “Statement” as a word can easily be translated into BSL, but to do so would be confusing because it would not match the physical realities of how the instrument would be accessed (on screen and through video). Consequently, instead of using “statement,” the BSL instruction was “You will see that there are several video screens—34 of them—which will be signed. What is signed on the screen relates to this week. You need to think about to what extent you have felt like that during this last week. There are five options that you can click: never, rarely, sometimes, often, or mostly/always.” Although the text of the items was not subtitled, the words or phrase for each of the rating anchors were provided as subtitles on the screen in the BSL instruction video when each of those anchors was signed.

Clarity of the frequency anchors: analog versus digital encoding. The decision to subtitle the frequency anchors, but not the items themselves, arises from the need for the anchors to be reliable punctuation of a continuous scale of frequency. However, features of BSL led us to simplify some of the English words in the rating anchors; for example, “not at all” was changed to “never,” “only occasionally” was changed to “rarely,” and “most or all the time” was changed to “mostly/always.” “Sometimes” and “often” were unchanged. These changes were made primarily for reasons of clarity. For example, one of the BSL signs

used for “often” and “all the time” can involve using the same hand shape, but the frequency of occurrence is differentiated by the speed of signing and facial expression; the more often something happens, the faster is the sign and the more severe is the facial expression, but the actual hand shape used remains the same: a good example of the use of more analog encoding in BSL compared with written English.

In face-to-face conversations that happen in real time, any potential confusion can easily be clarified between signers. However, the rating scale would be accessed autonomously and without live interaction. Therefore, to avoid any possible confusion, it was decided that the sign for each rating on the scale would be made visually distinct in its form, not just its movement: digitally, not analogically, distinguished. Although this makes sense for defining anchor points, it has to be recognized that it is a deviation from normal interactive signed BSL and results from the asynchronous form of delivery. Written language communication has many centuries of cultural evolution to cope with this absence of interaction, something that is relatively culturally new in signed languages and has only really become available and necessary with the creation of filmed signing in the past half century. This aspect of “taped” signed language will no doubt evolve and develop over the years within signing communities.

Pronouns and the direction of the signing. In the English version, statements usually start with “I,” so the readers will know that the statement is about them. For example, the English CORE-OM states: “I have felt despairing or hopeless.” However, it is different when a signer uses “I” in BSL. Imagine a participant watching the screen, seeing the signer on it produce a translated version of a statement that begins with “I.” There is the risk that the participant might think that the statement refers to what *the signer* might be feeling, rather than asking what *they*, the participants, feel. To minimize possible confusion, it was agreed to change the pronoun from “I” to “You,” resulting in a change in the direction of the signed item. “I have felt despairing or hopeless” in English becomes “This week, you (with the signer in the video signing toward the camera and respondent) have felt helpless and hopeless” in BSL.

In this way, it is clear that whoever is watching the video will know that it is asking them to what extent *they* have felt a certain way in the last week.

Format of the BSL CORE-OM shown on screen. The CORE-OM requires a participant to consider their feelings “over the last week,” rather than more generally. The English version is printed on a double-sided piece of paper, so one can easily glance back and see “Over the last week” clearly written at the top of both pages. However, in the BSL version, each item requires its own page in the web interface to accommodate the necessary separate video screen containing the BSL version of that specific item. There was concern that some people might forget that the statements are about how one has felt in the past week, rather than “at the moment,” or even in the past year, because the remainder of the time frame was missing. It was therefore agreed that each BSL statement on video would start with “In the past week.”

Specific Concepts Within CORE-OM Items

Emotional state in BSL. Some items in the CORE-OM include words related to one’s emotional state, such as “anxious” or “nervous.” In English, “anxiety” is one word, but it can have a range of meanings such as physical feelings of anxiety (sweatiness and heart pounding) and cognitive or emotional connotations (worrying thoughts). In BSL, there is more than one sign for anxiety depending on context and the nuance of the meaning that is sought. Therefore, covering the *range* of meanings in one sign for “anxiety” was challenging. One solution was to use a sign that involved the signer tapping on their heart. This was nonspecific and could potentially include a range of meanings; being anxious or nervous. However, the same sign, in terms of its shape (index finger curved), location (placed on the heart), and its movement (tapping several times), was used for both “anxious” and “nervous.” The differentiation in meaning is subtle and produced by the use of slightly different facial expressions while signing. Once again, the issue of remote access to the signing, rather than real-time, live interaction, raised concerns about potential confusion between the two signs. It was decided to use the sign for “anxiety” incorporating two

bent fingers placed on the side of the head, shaking the hand. The sign involving tapping the heart would be used for “nervous.” In this way, each sign was distinct when viewed via video but broad enough to encompass a range of potential meanings.

The intensity of facial expression in sign language. The intensity of facial expression in BSL is important and can modify a sign made with the hands to cover a spectrum of intensity that in English might be communicated with a succession of different words indicating intensity: “uneasy,” “anxious,” “worried,” and “terrified,” with qualifying adjectives used to add gradation “anxious,” “very anxious,” and “extremely anxious.” In BSL, the intensity of feeling throughout such a continuum can be indicated using the same sign but with progressively more intense facial expressions.

Some items were discussed in order to clarify the meaning of the statement. For example, “I have felt OK about myself” looks straightforward in English, but some of the translators were not sure which sign to use: a “thumbs up” (as in “I am fine”) or a moving open hand (as in “I am not too bad”) sign. The thumbs-up sign, with its positive connotations, might indicate that feeling OK is positive, as opposed to neutral. Additionally, because the statement is about how one feels about *oneself*, it was initially agreed to include a sign in which one’s hands “open up” the chest so that the signer can “look inside oneself” (indicating insight), so that viewers would be clear that the item was asking about *oneself*. However, the two back translators interpreted the second draft of the BSL version differently: “This week, you have felt OK in yourself” and “This week you have explored your feelings and feel good.” To avoid confusion about this item, it was agreed, in the final draft, to use only head movement to indicate the reference to oneself.

Use of visually motivated signs without giving examples. As BSL is a visual language, some signs can be iconic and visually motivated, although others are arbitrary, whereas words in English are completely arbitrary (Sutton-Spence & Woll, 1999). An example of this might be the term “suicidal”; in English, the written word and the sound of the word itself do not represent the meaning of the term “suicide.” However, in BSL,

the signs commonly used for suicide/suicidal may, to a greater or lesser extent, visually represent the action of killing oneself in a variety of different ways such as by hanging. This issue was resolved by translating the statement to refer to “ending one’s life,” rather than to “suicide,” but again this is a deviation from typical conversational BSL.

Statements such as “I have been physically violent to others” also proved difficult to translate into BSL without potentially giving visual examples that can be suggestive. “Physically violent” could mean anything including hitting, slapping, pushing, banging, or throwing things. Using certain signs for these examples could lead to the respondent thinking of these specifics and possibly omitting other aspects of physically violent behavior. In order to resolve this problem, the signer did not give specific examples but made it clear that the aim was to harm another person.

Using the appropriate sign for the specific context. Specific words in certain items could create difficulties. For example, “wrong” in the statement: “I have felt able to cope when things go wrong.” In English, it is not relevant who was at fault. However, if the sign for wrong (a fist with the little finger extended) were to be used, it could lead to viewers thinking that “wrong” in this instance meant “fault.” This is because this sign for wrong can sometimes be used in the context of “fault.” In BSL, this sign is usually associated with “bad.” It was agreed not to use the BSL sign for wrong, instead replacing it with the sign for “messed up,” which was appropriate for this context.

For a different item, namely, the English statement, “I have thought of hurting myself,” it was agreed to use the lip pattern for the word “harm” instead of “hurt” when signing. One translator felt that for Deaf BSL users, the sign used with the lip pattern “hurt” was more related to emotions; for example, “I feel hurt!” whereas “harm” was more physical and clearer for this item.

Confirmation of the statement. Sometimes in BSL, confirmation or negation is indicated by a sign at the end or near the end of a sentence. For example, when translating the statement “Tension and anxiety have prevented me doing important things,” the sign for

“cannot” is added at the end to reinforce the concept that negative feelings (tension and anxiety) are stopping one from doing important things. “Cannot” in BSL is equivalent to “prevent” in this context. This is one example of how sign languages do not follow a “Subject, Verb, Object” construction. Instead, they use multiple and *simultaneous* channels for language construction, such as location, movement, hand shape, and orientation (Sutton-Spence & Woll, 1999; Vermeerbergen & Leeson, 2011).

Words in a Deaf social context. Some items might be perceived differently by hearing people and Deaf people, for example: “Talking to people has felt too much for me.” “Talking” in this context could be misinterpreted as meaning communicating in spoken language only. If a Deaf person struggles to make themselves understood when talking, they may strongly agree with this statement, and yet feel perfectly able to communicate with others in ways they may have not taken this statement to incorporate. Hearing people might simply consider the word “talking” to mean speaking with other people and not think of it as including various other ways of communicating. It was therefore agreed to use a BSL sign indicating “discussing,” instead of “talking.”

Challenges of translating English words into BSL. Not all English words can be directly translated into BSL; these problem words are sometimes known as “false friends.” For example, “warmth” in English can mean affection, heat, and friendliness. When talking about affectionate warmth, the sign “warmth” in BSL would not make sense as it is usually associated only with heat.

Furthermore, some of the statements in the CORE-OM are in the passive case, or abstract English; information as to the “who” or “what” is not mentioned. However, in BSL, passive abstract information, such as “it” in the statement “I have thought it would be better if I were dead” needs to be made more explicit—to this end, several signs are required to elaborate on what “it” might be (“I,” “family,” “they,” etc.). In order to maintain the abstract nature of the original, it was agreed that “it” would be removed in

translation, leaving it vague regarding who would benefit if one were dead.

Discussion

The example we have used in this study relates to one sign language, British Sign Language, and one translation context—a standardized outcome measure tool used within mental health services. The question therefore arises, whether the translation challenges we have highlighted are generalizable to other signed languages and other translation contexts. The multidimensional nature of signed languages in comparison with written languages is the same regardless of the specific languages involved. Samady et al. (2008) describe this as the difference between working in three rather than two dimensions and describe translations into ASL as “composed of dynamic three-dimensional pictures created with the hands, body, and facial expressions” (Samady et al., 2008, p. 481). However, Stokoe regards signed languages as consisting of four dimensions: “Speech has only one dimension...; writing has two dimensions; models have three; but only signed languages have at their disposal four dimensions – the three spatial dimensions accessible to a signer’s body, as well as the dimension of time” (as cited in Sacks, 1989, p. 89–90). Slobin (2008, p. 15) describes this dimension in terms of “*gradient* phenomena that are available to signers – rate and intensity and expansiveness of movement.” These phenomena can radically change the nuance of meaning associated with the same signed expression. However, as we have demonstrated in this study, the finely grained movement nuances that create exact distinctions in meaning when used in conjunction with the same hand shape or location of sign may not be the best choice in all circumstances. They leave open possibilities of ambiguity of meaning, particularly when signed expressions are viewed from a distance (on screen) rather than interacted with as a result of live exchanges.

Moreover, standardized outcome measures commonly require responses indicating self-assessed degrees of intensity such as “rarely,” “often,” “frequently” and so on. Therefore, the kinds of gradient phenomena afforded by the fourth dimension of sign languages can also be highly advantageous. It allows for the easy expression of degrees of feeling through the rate and

intensity of a signed expression, usually in conjunction with other features of facial expression. In this sense, it is akin to the grading of volume in spoken languages and repetition of words to convey intensity (“no” said quietly is quite different from “no” said loudly and/or repeatedly). This kind of grading of intensity, whether in signed or spoken languages is usually referred to as “analogical” in that the medium allows the possibility of conveying different degrees of intensity on a continuous scale. In contrast, written texts cannot do this in the same way and are regarded as digital; they have singular points of expression which in and of themselves indicate differentiations in intensity usually through the choice of vocabulary (e.g., “only occasionally” versus “often”) or by attributing meanings to numbers (e.g., one versus three). The two-dimensional written text comes closest to analogical encoding of a continuous gradient when using two-dimensional visual means, for example, no no NO.

In common with broad translation literature as well as that specific to sign languages (Graybill et al., 2010), we knew that cultural equivalence of key concepts was critical. The linguistic correctness of a translated item was of less importance than the capacity of the translated item to be meaningful within the cultural context of those who would be completing the outcome measures. Similar to Graybill et al. (2010), we found that some concepts expressed by a single word could not be expressed by a single sign, and, similar to Montoya et al. (2004), that some phrases in spoken language had no equivalent in a signed language. But we also demonstrated that even when a culturally equivalent expression or term is found, it still may not be meaningful, because the root concept is not one that is common in the lives of those completing the outcome measure or may be differently understood. We note the example from our study of “feeling that you can talk to people.” In the context of other translation works on CORE-OM, Chris Evans noted that an often-cited example of difficulty in translations between spoken language cultures were the “risk to other” items because different cultures vary in the amount of shame involved in discussing anger and violence to the extent that it can be a seriously taboo topic in some cultures. Similarly, embedded cultural and religious links between suicide and guilt or shame

significantly influence the meaning attributed to the concept of “risk” in ways not considered in societies where risk may have a more functional or personally emotional meaning only.

The online format in our study also raises new issues for consideration. Generally, there has been a growth in research being carried out by means of computer, and issues pertaining to the use of using paper-and-pen versus computer-administrated outcome measures has been debated (Epstein, Klinkenberg, Wiley, & McKinley, 2001; Buchanan, 2002). Buchanan (2002), for example, questions whether online delivery of outcome measures might skew norms and argues that these should be established for the online versions and compared with the paper-and-pen versions. Other studies have reported the equivalence of psychometric properties in both types of administration of the outcome measure (e.g., Kleinman, Leidy, Crawley, Bonomi, & Schoenfeld, 2001). One of the benefits of using an online outcome measure over the paper-and-pen is identified as the potential to reach a large number of people, including those who may be at risk (Buchanan, 2002). In our study, the key advantage to online delivery was reaching a large number of a highly dispersed population in a format best suited to the properties of the language used *and* which ensured a fixed translation whose properties could be formally explored (Rogers et al., 2013a).

In the future, a key line of enquiry will be the investigation of the influence of the on-screen format on participants’ responses. This study suggested implications for the signed modality and online format, which should be investigated. For example, the necessity of repositioning self-referential words (“I” and “My” to “You” and “Your”), identified also by Montoya et al., (2004), has been clearly justified but goes against translation practice in the mainstream. What is its impact on the psychological self-reflection processes required to respond if a declarative “you” or “your” prompts that process rather a personalized “I” or “my”? Another issue relating to signed translations is that the instruction and the statements are delivered by a particular individual signing, whereas written translations are undesignated coming from a completely unknown, abstract other. This raises the question of whether the presence of an identifiable individual signer

might influence the way in which respondents answer. Sign Language communities, even on a national scale, are small communities; it is perfectly possible that the signer is known to a proportion of those who take the outcome measure. Their personal characteristics, family life, social status, professional expertise, and role in the Deaf community might also be known. In our study, we did not use an interpreter to sign the final versions of the BSL CORE-OM but deliberately used a native Deaf signer with an academic linguistic background. We did not investigate the implications of this choice in comparison with using a hearing interpreter who might be regarded as both an insider and an outsider. Yet, the interpreter's identity outside of this role would also have had an influence and s/he would have likely been known by some participants. The broader issue of whether it matters who delivers a seen signed translation and its effects requires investigation as online delivery of signed outcome measures is likely to grow.

Although the BSL version of the CORE-OM has now been produced, it does not necessarily mean that it is suitable for all signing Deaf communities in the United Kingdom. Issues that need to be considered include the regional variations of BSL across Deaf communities and the range of BSL competencies that exists within those communities. For example, the English version of the CORE-OM has been modified and simplified for people with learning disabilities. Having established the BSL-CORE-OM, it will now be possible to create a simpler version for those Deaf people with learning disabilities or who have low levels of BSL.

Conclusion

Despite considerable challenges, we were able to use the best practice translation processes formalized and required by the originators of the CORE-OM outcome measure to produce a reliable and valid version of this standardized outcome measure. In so doing, we have identified translation challenges and issues specific to signed languages, which are of generalizable significance. Robust, reliable outcome measures are vital to ensuring that the mental well-being of a Deaf person can be thoroughly assessed and appropriate services provided as has been the case for their hearing counterparts for some considerable time.

Notes

1. "Deaf" with a capital "D" is used when referring to a person who is culturally Deaf and whose first or preferred language is British Sign Language. "d/Deaf" is used to indicate those who are deaf without a specific differentiation. In the case of children and young people, we use the term "deaf," as it might not yet be clear what their preferred cultural identity is.

2. CORE System Trust is made up of some of the authors of the original instrument and one of the main sponsors of the work that developed its many applications. It is a not-for-profit company that holds and protects the copyright, so the measure remains free to reproduce on paper and it maintains the quality standards for translation. Contact Chris Evans if seeking more information on the CORE-OM, other CORE measures, and the CORE system more generally.

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