

Improving Scale Equivalence by Increasing Access to Scale-Specific Information

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Supplementary Materials

Note. This supplement is an entire self-contained article including its own title page, abstract, and reference list. It is a full-length exemplar of a scale-specific translation guide that happens to concern the Primals Inventory. For translators of the Primals Inventory and any others citing this supplement, please cite the parent article entitled “Improving Scale Equivalence by Increasing Access to Scale-Specific Information.”

A Scale-Specific Guide to Translating the Primals Inventory

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Abstract

Primal world beliefs (also called ‘primals’) concern the basic character of the world as a whole (e.g., the world is dangerous) and are theorized to influence many personality and well-being variables. A recent empirical effort identified 26 primals and developed an American English Primals Inventory to measure them, which researchers have begun to translate. These early translation efforts have revealed several critical scale-specific translation/adaptation challenges that justifies the creation of quality scale-specific guidance, the goal of the present article. Following Clifton and colleagues’ (2021) template for scale-specific translation guides, we discuss eight construct-level issues: (a) referencing *the world* in a variety of ways; (b) maintaining *the world* as the object of belief in cases of unusual syntax; (c) consulting atypical experts; (d) prioritizing item piloting; (e) maintaining item difficulty; (f) translating one or two additional items per subscale due to unusually short subscales; (g) including reverse-scored items and (g) calibrating one’s overall translation/adaption goal given that primals are currently so underexplored. We then detail item-level issues in a lengthy item-by-item table and, after providing lessons learned from the first two translation efforts into German and Italian, give final remarks prioritizing the most critical pieces of advice. Finally, though this article is being published as a supplement, the hope is that, should this scale-specific guide prove useful, similar scale-specific guides could be created for other scales, aiding cross-cultural research generally.

Keywords: primal world beliefs, Primals Inventory, translation, adaptation

A Scale-Specific Guide to Translation/Adaptation of the Primals Inventory

Background on Scale to be Translated

Beck (e.g., Beck, Rush, Shaw, & Emery 1979) suggested that beliefs about the self, the self's future, and the self's environment affect depression. Decades of clinical practice and research now confirm that such beliefs influence not only depression, but numerous wellbeing-related outcomes (e.g., Hofmann, Asnaani, Vonk, Sawyer, & Fang 2012). Yet beliefs about the environment remain understudied. To help fill this gap, Clifton and colleagues (2019) recently attempted a comprehensive effort to identify the major beliefs that specifically concern the overall character of the world. Twenty-six stable beliefs were identified. These *primal world beliefs* ('primals') concern whether, for example, the world is beautiful (vs. ugly), safe (vs. dangerous), and meaningful (vs. meaningless). Theoretically, primals and similar beliefs influence numerous psychological variables to which they are highly correlated, including optimism, gratitude, neuroticism, conscientiousness, depression, life satisfaction, and so forth (Koltko-Rivera 2004; Dweck, 2008; Clifton et al., 2019; Stahlmann et al., 2020). However, empirical work establishing influence, not just covariance, is needed. Clifton and colleagues (2019) developed a 99-item Primals Inventory in American English (PI-99-AE)¹ to measure all 26 primals. The PI-99-AE is now being translated into other languages, including German, Italian, Indonesian, and Spanish, with more translation efforts expected.

Indeed, the PI-99-AE ticks all ten boxes outlined by Clifton and colleagues (2021) indicating scale-specific translation guidance is appropriate. In addition to many future translation efforts are expected, the construct involves atypical conceptual elements, items

¹ Elsewhere, the original Primals Inventory is referred to simply as the PI-99. For the purposes of this paper—where it appears in comparison to translated versions—we will refer to it as the American English Primals Inventory or the PI-99-AE.

include culture-specific phrases, the scale is multi-dimensional, many opposite scored items are included, the scale involves considerable item-difficulty calibration that varies depending on the subscale, many subscales involve only four items allowing little room for translation error, the scale is too long to include guidance in the original scale validation article, and translation efforts may especially benefit from a few less routine scale-translation practices.

Please note this guide conforms to the format outlined by Clifton and colleagues (2021) for the creation of scale-specific translation guidance. It is not intended to replace scale-generic guides to translation—the authors are not translation experts—but is a supplement for those interested in translating the Primals Inventory specifically—we are item-writing experts only for this particular construct. For excellent scale-generic guidance, see van de Vijver and Hambleton (1996), Beaton and colleagues (2000), Borsa and colleagues (2012), or Hambleton and Lee (2013). Though the current focus is the PI-99-AE, our suggestions are relevant to the shorter form versions of the Primals Inventory (the six-item PI-6 that measures *Good* world belief, and the 18 item PI-18 that measures *Good*, *Safe*, *Enticing*, and *Alive*; Clifton & Yaden, 2021), and any tertiary subscales translated in isolation. Another resource that Primals Inventory translators might consult is an in press Chapter describing the history of world belief measurement and special challenges involved (Clifton, 2021). Suggestions in this guide are not strong recommendations. Lessons learned from the first PI-99-AE translation efforts into German and Italian (discussed below) underscore how every language and culture will present unique interpretation issues, and each translation effort must be approached individually. However, understanding the challenges, the strategies the research teams employed to overcome them, and the insights gleaned from these processes, may be useful. Finally, in this guide, the authors decided that detailing the different extents to which our claims and examples about word

meaning is supported by empirical evidence—often by piloting or replicable item response characteristics, but often not—or even how confident we are in our own subjective reasoning, was considered out of scope. Our purpose is to stimulate thinking among PI-99-AE translators keenly interested in this level of detail, not to prescribe what their thinking should be.

Construct-Level Issues

There are eight key translation/adaption issues that, due to the particular nature of the PI-99-AE or the particular nature of the latent phenomenon, are relevant to many if not most PI-99-AE items and subscales. These concern a scale-specific need for (a) referencing *the world*; (b) maintaining *the world* as the object of belief in cases of unusual syntax; (c) consulting atypical experts; (d) prioritizing item piloting over other best practices; (e) maintaining item difficulty despite needs that vary across PI-99-AE subscales; (f) translating one or two additional items per subscale due to unusually short subscales; (g) including reverse-scored items despite unusually short subscales; and (g) calibrating one’s overall translation/adaption goal given that primals are currently so underexplored.

Referring to “The World”

For many scales that measure beliefs, the object of belief is clear enough that a single, precise, familiar term can be repeatedly used across items. For example, a scale measuring a belief about the self often can use “I” across items, and a scale measuring beliefs about the efficacy of a particular medical procedure can repeatedly reference the name of that particular treatment (e.g., chemotherapy). A major scale-specific challenge when translating the PI-99-AE is determining how to refer to its unusual subject. Clifton and colleagues (2019, p. 83) say, somewhat cheekily, that primals are “only beliefs about everything.” Primals Inventory items, therefore, must not evoke thoughts of the self, society, one’s town, one’s country, nature, and so

forth, but what all of the above is generally like. A more complete definition of the object of belief follows:

Primals concern the [general trait-like character of the] world as a whole, and thus what is typical of most things and situations. Precise physical boundaries, such as this jungle or that solar system, are misleading. Instead, primals concern an individual's broadest psychologically meaningful habitat. (2019, p. 83)

This is an unusual object of belief. Among those who study beliefs and worldview, the focus is nearly always on narrow subjects or categories within the world rather than the world generally (Koltko-Rivera, 2004). Though the experience of primals researchers (e.g., the Italian translation effort discussed below) suggest that many Primals Inventory respondents and piloters possess a 'natural category' (i.e., schema) for this object of belief, some may not. Thus, it is important that items always evoke a sense of the world generally, rather than particular objects or categories within it. This can be difficult when even vaguely worded items (e.g., *the world is unstable*) can evoke highly specific ideas (e.g., climate change).

The items in the PI-99-AE refer to the world in roughly 35 different ways (Table 1). The most commonly used term is *the world*, with some variant employed in 41 items. The terms *everything* and *most things* appear in 15 items each, and the term *life* is found in 13 items. Many items combine terms, such as in the phrases *nearly everything in the world*, *most things in life*, and *life in this world*. Many of the terms, such as *the universe*, appear a handful of times while some, such as *humans, animals, plants, and pretty much everything else*, appear only once.

This language diversity was employed for two main reasons. First, no single word is perfect. English (and likely other languages) lacks a term for the general character of the world as a whole that (a) is defined from the individual's perspective, (b) forms one heterogenous yet

nonetheless meaningfully characterizable place, and (c) constitutes a base-rate or for most things and situations one might encounter. Thus, reliance on any one word would have increased systematic error associated with that word.

Table 1*Terms Used in the PI-99-AE to Refer to the World*

Term	Other Variants	Example Item
“the world”	“on the whole, the world” “the world you live in”	The world is hilarious; if we aren’t laughing, we aren’t paying attention. (<i>Funny</i>)
“the universe”	<i>none</i>	The universe needs me for something important. (<i>Needs Me</i>)
“life”	“life in this world”	Life overflows with opportunity and abundance. (<i>Abundant</i>)
“humans, animals, plants, and pretty much everything else”	“for all life—from the smallest organisms, to plants, animals, and for people too—everything” “most plants and animals, and even people”	Humans, animals, plants, and pretty much everything else can be organized by how important or good they are. (<i>Hierarchical</i>)
“everything”	“nearly everything in the world” “every single thing” “most everything” “basically anything encountered in life”	Everything deserves to be explored. (<i>Worth Exploring</i>)
“all”	“all the time”	Though things can appear separate and independent, they really aren’t. Instead, all is one. (<i>Interconnected</i>)
“nothing”	<i>none</i>	Nothing really matters all that much. (<i>Meaningful</i>)
“most things”	“most things in the world” “lots of things in the world” “most things in life” “things” “unfamiliar things and places”	Most things have a habit of getting worse. (<i>Regenerative</i>)
“most situations”	“most situations in life” “most things and situations”	Most situations are delicate. Though they may be fine now, things could easily unravel. (<i>Stable</i>)
“what happens in the world”	“whatever is happening around me” “much of what happens around me” “events happening around me” “things happening around me”	What happens in the world is meant to happen. (<i>Intentional</i>)
“everywhere”*	“everywhere, no matter where we look”* “no matter where we are or what the topic might be, the world”	Real danger is everywhere; even if we don’t notice it. (<i>Harmless</i>)

*Though technically adverbs and not the subject of the sentence in the PI-99-AE, these terms are used in place of *the world* when the typical sentence construction (e.g., *The world is beautiful*) is reversed (e.g., *Beauty is everywhere*).

Second, some terms used to refer to the world worked better for some primals (i.e., some subscales) and worse for others. Indeed, the term *world* has 16 dictionary definitions in English (Google Dictionary) and, depending the subscale, it is easy to evoke the same irrelevant meaning in the same way, resulting in subscale-specific systematic error. For example, the term *world* was adequate to refer to the subject in items measuring the belief that most things in the world are *Harmless* (e.g., *On the whole, the world is dangerous*; reverse-scored) and inadequate when trying to measure the belief that most things in the world are *Intentional* (hypothetically, *On the whole, the world is intentional*).² In American English, *the world* can also sometimes refer specifically to human society. Thus, pairing *the world* with the idea of intentionality draws out this unwanted meaning, leading to misinterpretations (across items in this particular subscale) about conspiracy theories, government control, and so forth. *The world* can also evoke particular meanings in large, American Christian subpopulations (i.e., of secular hedonistic society). Thus, the *Intentional* subscale relies instead on the word *universe* (e.g., *The universe doesn't care if events happen one way or another*). Of course, *universe* also has pitfalls. In English, it tends to conjure up outer space to the exclusion of matters closer to home. This may be acceptable for *Intentional* (cosmic purposes beyond the mundane and mechanical) but is, in turn, why the term was not used to measure *Harmless*, for example. An item like *On the whole, the universe is dangerous* might cause respondents to overweight the dangers of outer space, which is technically-speaking a very dangerous place for humans but may be largely irrelevant to the

² In this guide, the authors decided that detailing the different extents to which our claims and examples about word meaning is supported by empirical evidence—piloting or reproducible item response characteristics—or even how confident we are in our own claims, was considered out of scope. Our purpose is to stimulate thinking among PI-99-AE translators keenly interested in this level of detail, not to prescribe what their thinking should be.

psychologically-salient environment of most people, which is what primals items should most concern.

Similarly, translators will notice that some items directly reference the overall character of the world as one giant place (e.g., *On the whole, the world is a safe place*) while other items involve a statement about proportion (e.g., *Most things and situations are harmless and totally safe*). Some subscales involve items that reference the object of belief in both ways, but some are quite intentionally one-sided, such as *Beautiful*. These item-writing decisions were made for different reasons for different primals—differences that translators should be aware of and discussed at length below. For example, the item *Nearly everything in the world is beautiful* was considered superior to a hypothetical item like *The world is a beautiful place*, which might conjure the idea of a grand moral plan, an image of a literal globe that is aesthetically pleasing, or be confused for a poetic reference to human kindness, all of which are irrelevant to the simple idea that a place involves more or less beauty.

For these and other reasons, we make two suggestions. First, perhaps, translators should develop a bank of possible ways to reference the world, similar to Table 1. For each item, when translating a reference to the world, consider what other referents might serve better, thus avoiding reliance on strict translation. Thought may be given to why the PI-99-AE used the referents it did, but this should inform not dictate decisions in a new linguistic and cultural landscape. Second, whenever possible (and whenever in doubt), try to refer to the world in a diversity of ways both between and within subscales to reduce systematic error, allowing error associated with specific terms referencing the world to cancel itself out.

Maintaining the World as the Subject

As noted, primals are not beliefs about the self. However, since these are beliefs that the self holds about the world and are important to the self, this distinction can get tricky for some primals (e.g., *Improvable*, *Understandable*, and *Needs Me*). The PI-99-AE items often navigate this complexity by employing certain unusual American English grammatical constructions like expletives, which are not in this case profanities but the practice of using *it* or *there* as the subject of the sentence (e.g., *It feels like the world is going downhill*), as well as the passive voice (e.g., *The world needs to be continually improved rather than accepted*). In some target languages, these grammatical constructions may not be available or interpreted in the same way. If so, the critical element to be preserved is that the PI-99-AE is a scale about what one believes is actually true of the world—whichever phrase from Table 1 is used. For example, if a strict translation is not feasible for the expletive construction in *It feels like the world is going downhill*, the researcher may need to change the item to *The world seems like it is going downhill*, *The world feels like it is going downhill*, or *I feel like the world is going downhill*. The first option (*The world seems*) may be preferable. Though the PI-99-AE employs the *The world feels* construction at times, it may be interpreted in this context as attributing emotions to the world, which should be avoided. In addition, though the PI-99-AE occasionally uses the construction *I feel*, translators should avoid relying too heavily on it lest the self or the self's emotions becomes the respondent's loci of belief. It would not do to replace all *It feels* items with *I feel* for this reason. In American English, a speaker often describes perceived facts with language like “I feel” to soften the claim, signaling that the speaker is aware that others might see things differently. This may not be true of other cultural and linguistic contexts.

Consulting Unusual Experts

Any good scale translation process will involve a review committee comprised of experts in psychology, assessment, translation, and similar topics. In the case of primals, experts in two other topics are worth considering. First, as is commonly suggested (e.g., Beaton et al., 2000) though not always deemed critical, Primals Inventory translators are advised to consult an expert on the construct itself, such as the original authors of the PI-99-AE. Involving construct experts is particularly helpful for this scale because primal world beliefs are a largely overlooked phenomenon; pertain to an unusual and amorphous construct; can easily be confused with related constructs; and entail a rather complex, hierarchical measurement model involving three tiers and 26 subscales. With so many primals, it is easy for item-writing decisions to unwittingly imply the meanings of other primals, clouding factor structures.

Second, in a more unusual suggestion, we recommend that researchers consult a mass communications expert in the target language. This can be someone with applied expertise in modern communications or marketing and experience communicating to a contemporary, general audience of native target-language speakers. During the development of the PI-99-AE, the research team found that, whereas academics tended to emphasize face-validity of an item in a careful reading—which may be ideal for other scales—our marketing expert highlighted the impression an item would land in the mind of a fast-reading subject without any prior exposure to the ideas. The former approach is concerned with whether each item correctly captures the concept and its nuances given a careful reading; it is philosophical. The latter approach tolerates imperfections of meaning to prioritize an item’s ability to quickly tap into relevant preconceptions in the contemporary mental landscape and point respondent thinking in the right general direction, which is crucial for an unusual and amorphous object of belief like *the world*. This resulted in a tendency to prefer brevity, informality, and simplicity with attention to relevant

cultural and linguistic idiosyncrasies, even at the cost of some imprecision in terms or, unfortunately, easy translation. In guiding a primals translation effort, for example, a mass communications expert may be better poised to replace the many American English colloquialisms used in the PI-99-AE with appropriate target-language equivalents rather than remove them entirely, which a researcher may be prone to do. Even if mass communications or primals construct experts are not included, we recommend that translators consider these issues during the stages of translation, back-translation, and expert committee review (Beaton et al., 2000).

Prioritizing Piloting

Many scale-generic item-writing guides (e.g., DeVellis, 2016) note that using broad and vague terms in items can lead to problems, including dramatic misunderstanding of item content. PI-99-AE items are necessarily filled with broad and vague terms to a highly unusual degree. Thus, we recommend qualitative item pretesting/piloting, which is often recommended yet often deprioritized, to catch items that obviously miss the mark. In the creation of the PI-99-AE, piloting suggested approximately 15% of meticulously-edited items were consistently and entirely misunderstood by pilot participants—perhaps an unusually high proportion. The German and Italian PI-99-AE translation processes discussed below found similarly high item-failure rates, with the German process not encountering the issue until later in the process, forcing difficult item-retention decisions, because item piloting was not done. These high failure rates suggest to the authors that generally-worded items do not guarantee survey respondents will interpret the items generally. General and abstract language in primals items can create vacuums of meaning which overlooked, cultural nuances of words and phrases may fill, introducing systematic error related to particular and irrelevant environments. It was during piloting, for

example, that the authors found that *The world is unstable* made people think specifically—and consistently—about climate change, leading to the re-write *Most situations are fragile and easily ruined.*

Consistent with scale-generic guidelines, Primals Inventory piloting can be done with a minimum of 12 subjects (Sheatsley, 1983) though $N=30-40$ is desirable (Beaton et al., 2000).

The method PI-99-AE scale creators used—which was not described in sufficient detail in Clifton and colleagues (2019) to allow replication—was to have in-person pilot participants (a) read one item at a time; (b) give their answer (using the six response options of the PI-99-AE); then (c) explain in their own words what they thought the item was about. The one-on-one interview format was time-consuming but allowed cognitive interviewing or *think-aloud* techniques to clarify and probe for understanding of particular words or phrases (Collins 2003; Drennan 2003; Willis 2005). PI-99-AE scale creators found that online and text survey formats offered less rich but still useful feedback, especially if every respondent gave notes on all items. In our experience, only about 30 items could be covered during a one-hour in-person interview, and the PI-99-AE is 99 items long—or even longer as discussed below.

Translating Additional Items

The PI-99-AE is unusually unforgiving of translation error because it involves many subscales (22) involving very few items (4-5), at least one of which is opposite-scored, and items are intermixed across all 99 items in a different random order for each respondent. While the consistency of these scales in exploratory and confirmatory factor analysis despite such constraints is a testament to the robustness of the latent phenomena, this brevity and scale administration approach also means that, if even one translated item performs poorly, entire subscales can easily fail reliability benchmarks. This may leave the PI-99-AE translator unsure if

low reliability indicates a measurement failure or the discovery of a genuine cross-cultural difference in the latent phenomena. Therefore, when translating the PI-99-AE, we recommend that 1-2 additional items for every tertiary subscale be translated and administered, depending on the length of the original subscale (most are four items but some are five), for a total of six items per subscale. If piloting is not done, including additional items becomes even more critical, as the German translation experience below amply demonstrates. Note that later analysis can (and should) cull unnecessary items as needed, optimizing reliability as well as language diversity. For translators' convenience, the authors have selected additional items from the larger original pool of 234 American English items based on various psychometric considerations (especially factor loadings in the original sample of 930 respondents), language heterogeneity, response heterogeneity, and content validity (see supplement). If desired, other items can be found in the PROMAX tables starting on p. 230 of Clifton and colleagues' (2019) online supplement.

Calibrating Item Difficulty

Translators will notice that items in certain subscales, particularly in the seven tertiary primals related to *Enticing*, are pitched with more extremely worded forward-scored items and less extreme reverse-scored items. This item-writing decision was made so the forward-scored items would be more difficult to agree with and the reverse-scored items easier to agree with. An example forward-scored, strongly worded item is *It feels like interesting and exciting things surround us all the time*, and a qualified reverse-scored item is *Most things in life are kind of boring*. Notice the downtoner *kind of* and intensifiers *surround* and *all the time*. These insertions are carefully calibrated because very few would disagree with a generic item like *On the whole, the world is an interesting place* or agree with *On the whole, the world is a boring place*, creating skew and ceiling effects. Still, despite these efforts, PI-99-AE mean scores on primals

like *Harmless* hover near 2.5 on a 0 to 5 scale—with no intensifiers and downtowners—while *Interesting* can be as high as 3.5—with extensive use of intensifiers and downtowners (p. 282-289 of Clifton and colleagues' 2019 supplement contains all PI-99-AE descriptive statistics). Thus, when it comes to Primals Inventory translation, efforts must be made to mimic these subscale-specific efforts to optimize item-difficulty, as appropriate for the target cultural context. More detail is provided on these subscale-specific decisions in the supplement.

Including Both Forward- and Reverse-scored Items

The validity of any belief measure requires the identification of at least one reasonably-high-loading forward-scored item and one reasonably-high-loading reverse-scored item (Clifton, 2020). This allows for what Tay and Jebb (2018) call *continuum specification*; just because a pair of ideas are conceptually opposite does not mean they are empirically opposite. Indeed, in the case of the PI-99-AE, Clifton and colleagues (2019) found empirically that some primals are best understood as unipolar while some are clearly bipolar. For example, conceptual opposites for *Beautiful* are many, including dullness, ugliness, meaninglessness, and so forth, not to mention mere absence of beauty (i.e., unipolarity). But factor analysis results were clear; the opposite of *Beautiful* was in fact the presence of ugliness. In contrast, the empirical opposite of *Funny* world belief was the mere absence of the humorous rather than, say, the presence of seriousness; items about seriousness did not load on that factor. Indeed, because Clifton and colleagues (2019) required adequately-performing reverse-scored items for every subscale, all PI-99-AE subscale continuums are specified—but only for American contexts.

If Primals Inventory translators wish to be similarly confident that continuums are specified, we recommend the standard of having adequately loading opposite-scored items on every scale, especially in the analysis stage. To achieve this, it is helpful to include at least two

forward-scored items and at least two reverse-scored items in the initial, approximately six-item pool for each subscale. Doing so will help ensure at least one performs adequately.

Clarifying Translation/Adaptation Goal

When translating/adapting measures of well-studied latent phenomena with dimensionality known to be reasonably universal (e.g., BIG 5 personality traits), the typical goal is confirmatory, to replicate the measure as is, including dimensionality, in the new culture. Primals, however, are understudied. The PI-99-AE was created via a distinctly exploratory process called *discovery-minded scale-building* (Clifton, 2020) which uses methods suitable for empirically mapping overlooked spaces and emphasizes validity over reliability. For example, the effort began with 10 extensive exploratory projects (e.g., analysis of >80,000 tweets and >800 most frequently used English adjectives) so that many if not all possible candidate primals could be represented in large exploratory factor analysis studies (Clifton et al., 2019). These efforts included focus groups among Chinese mainlanders as well as American Hindus and Buddhists; analysis of various non-Western sacred and secular texts; and other investigations in non-WEIRD cultures (Henrich et al. 2010). Still, the main thrust was WEIRD (white, educated, industrialized, rich, democratic) and all three initial factor analysis studies used American samples. Because other cultures may well vary on different dimensions of primals (see German experience below), translators may choose to take a more exploratory or confirmatory approach as they wish. Given the recent and extensive exploratory efforts, their costliness, and the perceived urgency of primals research, many translators may choose a more confirmatory approach but with an eye for clues that may arise during dimensionality analysis that suggest the value of more extensive exploration down the road. Such exploration could provide further insight into whether primals are universal and, if so, which ones.

Item-Specific Issues

Due to the length of the PI-99-AE, our comments on individual item wording take the form of a lengthy table (Table 2). It includes the following elements:

- definitions for each primal
- original items from the PI-99-AE
- 1-2 recommended additional items per subscale selected from the initial pool of 234 items based on various criteria (especially factor loadings), so at least 2 opposite-scored items are administered
- item-specific annotations highlighting intensifiers (language intended to make the item more difficult to agree with); downtoners (language intended to make the item easier to agree with); and colloquialisms requiring adaptation
- notes highlighting specific challenges each subscale posed in American English

Perhaps the most important part of this table is the definitions; it is important to write each item so that it pinpoints that particular primal and no others. Thus, translators will want to have a thorough understanding of all 26 primals from the outset. The authors tried to limit subscale-specific notes to only those most pertinent issues for translation purposes. For those interested in a more detailed discussion of how and why items were written as they were, see the example description of the development of the *Abundant* subscale on page 137-144 of Clifton and colleagues' (2019) supplement, especially Table 2.2-1. Another resource to consult is www.myprimals.com where the meaning of each primal is discussed at more length along with representative quotes from history, literature, Twitter, and so forth.

Table 2*Annotated Table of PI-99-AE Items for Translation Purposes*

Abundant (4 items; 2 additional items)				
Definition: Abundant (vs. barren) is the belief that the world is a promising place full of opportunities and resources.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
The world is an abundant place.	.	.	.	Language Choices: In American English (AE), “overflow” and “tons and tons” provide a sense of abundance beyond their literal meaning; “few and far between” is a colloquial phrase. We recommend translators select words and colloquial phrases that capture abundance / scarcity in the respective language (e.g., not strictly translate “tons and tons”). While the first and fourth item seem redundant, the addition of “with tons and tons to offer” makes the fourth item considerably more difficult to agree with and was found in the PI-99-AE to capture reasonably different variance. The phrase “even if we don’t see them, that doesn’t mean they aren’t there” is used to probe views of the world’s actual character regardless of how one feels about that character.
The world feels like a barren place with few opportunities.*	.	.	.	
Life overflows with opportunity and abundance.	X	.	.	
The world is an abundant place with tons and tons to offer.	X	.	<u>X</u>	
Recommended Additional Items				
Good opportunities are everywhere; even if we don’t see them, that doesn’t mean they aren’t there.	.	.	.	
Great opportunities are <u>few and far between</u> .*	.	.	<u>X</u>	Other Concerns: In analysis of the PI-99-AE, forward scored items related more to <i>Enticing</i> while reverse-scored items related more to <i>Safe</i> . No other tertiary primal splits across secondary primals in this way.

Acceptable (4 items; 2 additional items)				
Definition: Acceptable (vs. unacceptable) is the belief that the world and most things in it are best accepted “as is.”				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
The world needs to be continually improved rather than accepted.*	X	.	.	<p>Language: Unlike most other subscales, this one depends on one word (i.e. “accept” is found in every item), so translating “accept” requires careful attention. The translator may consider translating it differently across items to decrease systematic error.</p> <p>Ceiling Effects: Relatively few people are likely to disagree that many things need to be improved; thus, some items contain intensifiers. Thus, striving to improve everything all the time (forward-scored items) contrasts with striving to accept most things as they are (reverse-scored items). Intensifiers for this primal do not need to be as strong as some others, like <i>Beautiful</i>, however.</p>
Most situations in life need to be improved, not accepted.*	.	.	.	
Rather than accepting things as they are, the world needs to be improved <u>as much as possible</u> .*	X	.	X	
It's <i>usually</i> better to accept a situation than try to change it.	.	X	.	
Recommended Additional Items				
More things in the world need to be accepted than changed.	.	.	.	
Most things and situations need to be accepted as they are.	.	.	.	

<i>Beautiful</i> (4 items; 2 additional items)				
PI-99-AE Original Items				
	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
<i>Though some things are incredibly beautiful, they're <u>few and far between</u>.*</i>	X	X	X	Definition: Beauty/ugly should not be translated into generic good/bad language. This primal is about aesthetics primarily. Language: "No matter" is a colloquial phrase used to mean "any" as in "anywhere" but with even more emphasis. "Way more" means "very much more." This primal could have used more language diversity for beauty, but other similar words in English tend to be used for humans primarily (e.g. <i>gorgeous</i>). Ceiling: While the forward scored items require intensifiers to make them more difficult, reverse-scored items require downtoners to make them easier to agree with. Without doing both, opposite scored items may not load on each other.
<i><u>Nearly</u> everything in the world is beautiful.</i>	.	X	X	
<i>In life, there's <u>way more</u> beauty than ugliness.</i>	X	.	X	
<i>There is beauty everywhere, <u>no matter</u> where we look.</i>	X	.	X	
Recommended Additional Items				
<i><u>No matter</u> where we are, incredible beauty is <u>always</u> around us.[□]</i>	X	.	X	
<i><u>Though</u> some things are <u>beautiful</u>, most things are not.*</i>	.	X	.	Other: The first recommended additional item (noted by [□]) is already included in the PI-99-AE to measure the secondary primal <i>Enticing</i> .

<i>Changing</i> (5 items; 2 additional items)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Everything feels like it's shifting and changing.	.	.	.	Language: "Pretty much" means "for the greater part." "Whirl" is often a hard word in translation, but some have used things like "whirlwind" or "vortex"; this word should give the feeling of constant change.
I feel like everything changes <u>all the time</u> .	X	.	X	Other: This primal involved relatively weaker psychometric signal than others (comparatively low internal consistency, factor loadings, etc.), requiring the use of five items, only one of which is reverse scored, to maintain internal reliability. Therefore, the inclusion of slightly more redundant language might be helpful. The translator will notice that forward-scored items need to be intensified while reverse-scored items need to be qualified.
Everything feels like a whirl of constant change.	X	.	.	
The world is a place where most things stay <i>pretty much</i> the same.*	.	<i>X</i>	X	
Everything feels like it's constantly moving, changing, and <u>up in the air</u> .	X	.	X	
Recommended Additional Items				
<i>Though some things change</i> , most things stay <i>basically</i> the same. *	.	<i>X</i>	.	
Most things are rapidly changing in ways that really matter .	X	.	.	

<i>Cooperative</i> (4 items, 2 additional items)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Instead of being cooperative, life is a brutal contest where you <u>got to</u> do whatever it takes to survive.*	X	.	X	Language: “Got to” is a colloquial phrase meaning “must.” “Whatever it takes” means “anything necessary.” Words “brutal” and “cutthroat” describe competition to ensure it is interpreted as more than a sport or a friendly game; otherwise the items would be too easy to agree with. This is a competition to survive.
For all life—from the smallest organisms, to plants, animals, and for people too—everything is a cut-throat competition.*	X	.	.	Ceiling: Both forward and reverse-scored <i>Cooperative</i> items require intensifiers because otherwise they would be too easy to agree with.
Instead of being cooperative, the world is a cut-throat and competitive place.*	X	.	.	Other: Unlike other primals, most of these items were written such that reverse-scored items virtually must load on forward-scored items because items include reference to both. This forces the dimensionality to work, limiting the usefulness of factor analysis to yield latent dimensionality, but also allows the respondent to rightly understand the intended meaning of items.
Recommended Additional Items				
In general, life succeeds and thrives through cooperation rather than competition.	.	.	.	
<u>No matter</u> where we look, there’s trust, cooperation, and sharing. Cut-throat competition only plays a small role.	X	.	X	

Funny (4 items; 2 additional items)				
PI-99-AE Original Items				
	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
The world is hilarious ; <u>if we aren't laughing, we aren't paying attention.</u>	X	.	X	Definition: In the PI-99-AE, the opposite of <i>Funny</i> was empirically determined to not be solemnity or seriousness but simply the absence/infrequency of funny things, which is associated with laughter.
There's humor in everything .	X	.	.	Language: Translations of “funny” should not indicate strangeness or weirdness as “funny” can sometimes suggest in English or “fun” as in having a good time. “If you’re not [insert action/emotion], you’re not paying attention” is a colloquial phrase that indicates something is true whether or not one recognizes it. “Not that funny” means “not very funny.”
While <i>some</i> things are <i>humorous</i> , <i>most of the time</i> the world is not <i>that funny</i> .*	.	X	.	
Laughing a ton makes sense because life is hilarious and humor is everywhere .	X	.	X	Ceiling: Forward-scored items need to be intensified and reverse-scored need to be qualified because nobody would believe nothing is funny and everyone would agree that many things are funny. “Hilarious” is stronger than “funny” whereas “humorous” is a bit weaker than “funny”.
Recommended Additional Items				
The universe is hilarious .	X	.	.	
Though <i>some</i> things are funny, most things aren't <i>that humorous</i> .*	.	X	.	

Harmless (5 items; 2 additional items)				
Definition: Harmless (vs. threatening) is the belief that the world and most things in it are typically not very dangerous.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Real danger is everywhere ; even if we don't notice it.*	X	.	.	<p>Language: “Totally” is often used colloquially among American English speakers in place of “very” to indicate emphasis (i.e. “totally safe”) rather than a categorial statement (e.g. “completely safe”). “On the whole” means “in general”</p> <p>Other: The translator likely does not need to include the additional items for this subscale. Signal tends to be very strong (high internal consistency, factor loadings, etc.), and there are already two reverse-scored items. (Only five items were included in the PI-99-AE because the fifth item (denoted by ¶) is the best indicator of the secondary primal <i>Safe</i> and is also helpful on this tertiary subscale.) Additional items are still provided in case translators prefer consistency.</p>
Most things and situations are harmless and <u>totally</u> safe.	X	.	X	
I tend to see the world as <i>pretty</i> safe.	.	X	.	
<u><i>On the whole</i></u> , the world is a dangerous place.*	.	X	X	
<u><i>On the whole</i></u> , the world is a safe place.¶	.	X	X	
Recommended Additional Items				
It feels like danger and threatening situations are all around .*	X	.	.	
It seems like no matter where I go, I expect things to be safe.	X	.	X	

<i>Hierarchical</i> (5 items; 2 additional items)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Most things in the world could be ranked in order of importance.	.	.	.	Definition: The meaning of this primal may seem abstract, but that is likely primarily a function of, in English, not having an easy way to refer to it, requiring the long label “ <i>Hierarchical</i> ”. It would be interesting if other languages have better labels to get at the same idea.
Humans, animals, plants, and <i>pretty much everything</i> else can be organized by how important or good they are.	.	X	X	Language: A strict translation of the colloquial phrase “pecking order” might be inappropriate; translators might prefer a culture- or language-specific way of referring to hierarchies, but avoid anything overly specific to human relationships. “Just” means “only” in this situation.
Most things can be organized into hierarchies, rankings, or <u>pecking orders</u> that reflect <i>true</i> differences among things.	.	X	X	Ceiling: The downtoners here, especially when qualifying “differences,” are important because no one would claim that everything is exactly the same or completely different. These phrases keep either forward- or reverse-scored items from being too difficult to agree with. In other words, the conceptual range was constrained to capture a more platykurtic response distribution.
Most things aren't better or worse. It's <i>hard</i> to organize the world into hierarchies, rankings, or <u>pecking orders</u> that reflect <i>true</i> differences.*	.	X	X	
Things are <i>rarely</i> equal. Most plants and animals, and even people, are better or worse than one another.	.	X	.	
Recommended Additional Items				
Most things aren't better or worse, but <i>just</i> different.*	.	X	.	
Ranking things from better to worse is meaningless. Most things are <i>pretty</i> equal.*	.	X	.	

<i>Improvable</i> (5 items; 2 additional items)				
Definition: Improvable (vs. too hard to improve) is the belief that most things can be readily changed for the better.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
It's possible to significantly improve basically anything encountered in life.	X	.	.	Definition: The opposite of <i>Improvable</i> is not unchangeable, which would relate too much conceptually to <i>Stable</i> (vs. fragile) or static (vs. <i>Changing</i>). Instead, this primal captures the general difficulty level of making things better. Avoid connotations that make the respondent think too much about big things, such as governments, poverty, climate, etc. (e.g., “the world is malleable”—of course such big things are hard to change. Instead, the phrases “most things and situations,” “life,” and “things” indicate typical malleability, mundane or not. Additionally, items should avoid implying whether things are easy or hard to change for the respondent specifically. Items should <i>not</i> measure beliefs about <i>one's own competence</i> or ability to change things but how difficult things generally are to change <i>for any given agent</i> (person, creature, or even natural force), hence the importance of phrases like “No matter who you are.”
In most situations, making things way better is absolutely possible.	X	.	.	
Most things and situations are responsive, workable, and totally possible to improve.	X	.	.	
Most situations seem really difficult if not impossible to improve.*	X	.	.	
No matter who you are, you can significantly improve the world you live in.	X	.	.	
Recommended Additional Items				
Life is full of stubborn problems, situations, and issues that <u>just</u> can't be solved.*	X	X	X	
Though sometimes hard, it feels totally possible to change things and make them much better.	X	.	.	Ceiling: Both forward and reverse-scored <i>Improvable</i> items require intensifiers because otherwise they would be too easy to agree with.

<i>Intentional</i> (5 items; 2 additional items)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Events happen according to a broader purpose.	.	.	.	Definition: In translation, avoid the suggestion of either human purpose or divine/religious purpose. This primal concerns intentionality behind everything from the weather to soulmates and is blind to where that intentionality comes from. Likewise, items should not connote a conspiracy theory or some particular group in society pulling the strings. Items should not be written to indicate whether the underlying purpose is good or bad (the term “purpose” unfortunately has positive connotations in English). Finally, for the PI-99-AE, many self-identifying atheists score high on this primal. This is only possible if terms associated with religion is avoided.
What happens in the world is <u>meant to happen</u> .	.	.	X	
Events seem to lack any cosmic or bigger purpose.*	.	.	.	
The universe doesn’t care if events happen one way or another.*	.	.	.	
Everything happens for a reason and on purpose.¶	.	.	.	
Recommended Additional Items				
The universe does things on purpose.	.	.	.	Language: This subscale is likely too dependent on the word “purpose”. If the additional items are used, we recommend exchanging the term “purpose” for some alternative words.
Events seem to happen without a broader intention or purpose.*	.	.	.	Other: Like <i>Harmless</i> , the <i>Intentional</i> subscale likely does not require the additional items. Signal tends to be very strong for this latent variable in the PI-99-AE, and the scale already includes two reverse-scored items (the PI-99-AE includes five items only because the fifth¶ is the best indicator of secondary primal <i>Alive</i> but also useful on this tertiary subscale).

Interactive (5 items; 2 additional items)				
Definition: Interactive (vs. indifferent) is the belief that events happening in the world are reacting to you personally. (This primal was originally labeled <i>About Me</i> .)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Whatever is happening around me <i>often</i> feels related to me or something I've done.	.	X	.	Definition: It is important not to write these items in such a way that suggests narcissism or activates social desirability biases, which is why these items were softened to describe how people feel about something vs. what people think about it. The concept in target is whether the activities of the world are reactions to you personally or to something you personally have done—via weather patterns, who you happen to meet on the street, whether your bus is late, etc. One who sees the world as interactive may think the universe is trying to send them a message, teach them something, punish them, reward them, or push them to do something. For example, if someone plans a picnic, and it rains, one who sees the world as interactive may think the weather is a punishment for something he or she did.
When unsure why something is happening I <i>often</i> suspect it's got <u>something to do with me</u> .	.	X	X	
Much of what happens around me feels like it's because of me or related to me somehow.	.	.	.	
My first instinct about events happening around me is that they're unrelated to me or anything I've done.*	.	.	.	
My first instinct about things happening around me is that they <u>have to do with</u> me or something I've done.	.	.	X	
Recommended Additional Items				
It's safe to assume, and I usually do, that whatever's happening is <i>probably</i> not about me or responding to something I've done.*	.	X	.	
<u>Usually</u> what's going on around me has <u>nothing to do with</u> me.*	.	X	X	

Interconnected (4 items; 2 additional items)				
Definition: Interconnected (vs. separable) is the belief that everything is interdependent and largely inseparable.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Every single thing is connected to everything else.	X	.	.	<p>Definition: Items should not imply that connection or disconnection is either good or bad.</p> <p>Ceiling: The forward-scored items are intensified and the reverse-scored items qualified for this primal.</p>
The world is a place where everything is completely interconnected.	X	.	.	
Though things can appear separate and independent, they really aren't. Instead, <u>all</u> is <u>one</u> .	X	.	X	
Most things are <i>basically</i> unconnected and independent from each other.*	.	X	.	
Recommended Additional Items				
Most things are best understood as <u>pretty</u> independent and separate from each other.*	.	X	X	
Nothing is <i>truly</i> separate from anything else. Everything is connected.	X	X	.	

Interesting (4 items; 2 additional items)				
Definition: Interesting (vs. boring) is the belief that the world and most things in it are fascinating and intellectually engaging.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Most things in life are <i>kind of</i> boring.*	.	X	X	Language: “Kind of” and “pretty” in these situations means “somewhat.”
While some things are interesting, most things are <i>pretty</i> dull.*	.	X	X	Ceiling: In this subscale, it is especially important that forward-scored items be intensified and reverse-scored items qualified. For example, note the softening of “kind of” and “somewhat.” Some reverse scored items even acknowledge that there are interesting things but just not that many of them.
The world is a <i>somewhat</i> dull place where plenty of things are not <i>that</i> interesting.*	.	X	.	
It feels like interesting and exciting things surround us all the time.	X	.	.	
Recommended Additional Items				
Everything is interesting, no matter where we are or what we're doing.	X	.	.	
The world is always a fascinating place.	X	.	.	

Just (5 items; 2 additional items)				
PI-99-AE Original Items				
	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
<i>On the whole</i> , the world is a place where we get what we deserve.	.	<i>X</i>	<u>X</u>	<p>Definition: Items should not primarily conjure up whether society treats its members fairly (i.e., faith in particular human institutions like courts of law) but that the universe is a place that tends to balance things out, especially moral equations. Presumably, this assumption would hold on alien planets with totally different institutions, law codes, etc., or in the afterlife.</p> <p>Language: The English version may rely too much on the word “world,” which often denotes society, though the third item (“Life will find ways...”) still loads well; it does seem, however, to include variance associated with <i>Alive</i>, which is only a problem if multiple items include similar error patterns (i.e., systematic error).</p>
The world is a place where we rarely deserve what we get.*	.	.	.	
Life will find ways to reward those who do good and punish those who do bad.	.	.	.	
The world is a place where working hard and being nice <u>pays off</u> .	.	.	<u>X</u>	
If someone is generous and kind, the world will be kind <u>back</u> .	.	.	<u>X</u>	
Recommended Additional Items				
The world <i>usually</i> rewards and punishes unfairly.*	.	<i>X</i>	.	
Those who find misfortune <i>most often</i> bring it on themselves.	.	<i>X</i>	.	

<i>Meaningful</i> (4 items; 2 additional items)				
PI-99-AE Original Items				
	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Nothing <i>really</i> matters <i>all that much</i> .*	.	X	.	Ceiling: <i>Meaningful</i> and <i>Interesting</i> are probably the two primals most susceptible to ceiling effects on forward-scored items, so forward-scored items must be more strongly worded than reverse-scored items. More reverse-scored items were retained in the English version primarily because they seemed to suffer less from ceiling effect issues (i.e., responses were more evenly distributed). For example, the first additional item “The world is full of...” is likely not strongly worded enough; translators might consider making it more extreme, such as exchanging “full of” with “overflowing with” or “brimming with”.
Most things are pointless and meaningless.*	.	.	.	
The world is a place where things <i>just</i> don't matter.*	.	X	.	
The world is a place where most everything matters.	X	.	.	
Recommended Additional Items				
The world is full of meaning and meaningful moments.	X	.	.	<u>X</u>
<u>In light of</u> everything wrong with the world, it might be better if nothing existed at all.*	.	.	X	

Needs Me (4 items; 2 additional items)				
Definition: Needs Me (vs. doesn't need me) is the belief that the world needs you for an important task.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
The universe needs me for something important.	.	.	.	Definition: It is important that items avoid, if possible, a sense that agreeing with forward-scored items means confessing to narcissism. Likewise, agreeing with reverse-scored items should not imply participants are worthless but just that the world does not have a need or special role for them personally. Again, the emphasis in this belief should be on the world and its character, something in the nature of the world that makes it need, not on the self or something about the self that makes it needed, to the extent possible. For example, when describing a baby, a prime attribute of the <i>baby</i> and not the mother is that the baby needs its mother. Likewise, items should be primarily be about the needs of the world, not the neededness of the self.
The world needs me and my efforts.	.	.	.	
Life has an important <u>part to play</u> .	X	.	<u>X</u>	
It feels like the world doesn't <i>really</i> need me for anything.*	.	<i>X</i>	.	
Recommended Additional Items				
There's nothing <i>important</i> the world needs me for.*	.	<i>X</i>	.	
I feel like life has <i>hardly</i> any <i>real</i> or <i>significant</i> tasks for me.*	.	<i>X</i>	.	Language: A "part to play" is a colloquialism derived from having a role in a theater production. Translations do not need to retain the theater reference, but it should evoke that the respondent is needed for something particular. The respondent is not just a nameless member of the supporting cast; he/she has a part in the play. Using a sports analogy, the respondent is needed for the starting lineup, not just sitting on the bench.

Pleasurable (5 items; 2 additional items)				
PI-99-AE Original Items				
	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Life offers more pain than pleasure.*	.	.	.	Definition: The belief that the world is good and the belief that the world is pleasurable are statistically indistinguishable in the English version; thus, some items merely use the modifier “good.” The translator may want to include enough items of each (<i>Pleasurable</i> vs. <i>Good</i>) to test if this holds in the target language/culture. If so, more items are available in our (Clifton et al, 2019) supplement.
Life in this world is <i>usually</i> pain and suffering.*	.	<i>X</i>	.	
<i>On the whole</i> , the world is a good place.	.	<i>X</i>	<u>X</u>	
Most things in the world are good.	.	.	.	
Life offers <u>way more</u> pleasure than pain.	X	.	<u>X</u>	
Recommended Additional Items				
The world is full of pleasures and almost always enjoyable.	X	.	.	
More things are bad than good in the world.*	.	.	.	

Progressing (4 items; 2 additional items)				
Definition: Progressing (vs. declining) is the belief that the world is getting better instead of worse.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
<i>On the whole</i> , the world is getting worse.*	.	X	X	Definition: It is important to understand the differences between <i>Progressing</i> and <i>Regenerative</i> when translating these items. <i>Progressing</i> concerns the direction of the world as a whole as one big place. <i>Regenerative</i> concerns whether the natural tendency of most things and situations is entropy. Thus, there are people who see the world as getting better overall (<i>Progressing</i>) despite also believing that the natural state of most things is to fall apart (<i>degenerative</i>). In the creation of the PI-99-AE, the scale creators thought these two ideas would collapse into each other during factor analysis, but they diverged instead. It may be, however, that the distinction is not statistically meaningful in other cultures/languages, which would be interesting.
It feels like the world is <u>going downhill</u> .*	.	.	X	
<i>Though the world has problems, on the whole</i> things are definitely improving.	X	X	X	
It feels like the world is <u>better and better</u> .	.	.	X	
Recommended Additional Items				
<i>On the whole</i> , the world is improving.	.	X	X	
The world keeps changing for the worse.*	.	.	.	
Other: Psychometric signal for this primal tends to be very strong in the PI-99-AE. Additional items are less likely to be necessary.				

<i>Regenerative</i> (4 items; 2 additional items)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Over time, most situations naturally tend to get worse, not better.*	.	.	.	Definition: See above under <i>Progressing</i> on the difference between <i>Progressing</i> and <i>Regenerative</i> . Note that the items concern the tendency of things and situations rather than the world as a whole on a global level. This interest in situations should be preserved in the translated items lest they load on <i>Progressing</i> rather than <i>Regenerative</i> . Indeed, across tertiary subscales, strategic choices should be made regarding when to refer to the world as one big place (e.g., “On the whole, the world is...”) and when to refer to the preponderance of individual objects within the world (e.g., “most things are...”).
The usual tendency of most things and situations is to get better, not worse.	.	.	.	
<i>Though sometimes situations get worse, usually they get better.</i>	.	X	.	
Most things have a habit of getting worse.*	.	.	.	
Recommended Additional Items				
Over time, most situations tend to improve, rather than decline.	.	.	.	
<i>Though sometimes situations get better, usually they get worse.*</i>	.	X	.	

<i>Stable</i> (4 items; 2 additional items)				
PI-99-AE Original Items				
	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
The world is a place where things are fragile and easily ruined.*	X	.	.	<p>Definition: Whereas <i>Improvable</i> concerns the degree to which things can readily be changed for the better, <i>Stable</i> concerns whether or not things can readily be changed for the worse. <i>Stable</i> is also related to, though empirically distinguishable from, <i>Regenerative</i> at least in American English.</p>
Most things and situations are delicate and easily destroyed.*	X	.	.	<p>Language: “It takes a lot for things to fall apart” was retained in the PI-99-AE less for being the best item based on reliability and factor loadings, but for offering excellent language diversity and face validity.</p>
Most situations are delicate. Though they may be fine now, things could easily unravel.*	X	.	.	<p>Ceiling: The intensifiers like “easily” are important here because the mid-range is too easy to agree with, such as “many things fall apart.”</p>
It <u>takes a lot</u> for things to <u>fall apart</u> .	X	.	X	
Recommended Additional Items				
It <u>doesn't take much</u> for most things and situations to <u>fall apart</u> .*	X	.	X	
The world is a place where things are stable and hard to ruin.	X	.	.	

Understandable (4 items; 2 additional items)				
Definition: Understandable (vs. too hard to understand) is the belief that most things are easy enough to comprehend.				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Most everything is <u>easy enough</u> to understand.	.	X	X	Definition: Items should not concern whether things are mysterious or beyond comprehension in some profound (e.g. mystical or spiritual) way. Rather, like <i>Improvable</i> , it concerns something more mundane, namely the extent to which people have a base-rate expectation that intellectually comprehending a thing is difficult.
The world is <u>easy enough</u> to understand.	.	X	X	Language: Also, again like <i>Improvable</i> , items should be written in such a way to avoid making participants sound like they are stupid, particularly incompetent at understanding things, or often have feelings of confusion. Insofar as possible, items should be written such that they do not tap variance associated with any self-beliefs (e.g., <i>I am smart</i>) but rather a belief about the character of the external world that all of us presumably share. Inserting a phrase like “no matter who you are” might help translators ensure this point.
Lots of things in the world are too confusing and difficult to understand.*	X	.	.	
The world is a confusing place where many skills and subjects are too hard to figure out.*	X	.	X	Ceiling: Finally, note that “easy enough” is a useful phrase here because, rather than the idea that the world is easy to understand (few would likely agree with that), this phrase implies that understanding is typically within reach for any given person, given the appropriate investment of time and effort.
Recommended Additional Items				
The world is full of confusing things and topics that are <i>likely too</i> difficult to learn or understand.*	X	X	.	
I expect tons of situations and topics to be too difficult to learn or <u>figure out</u> .*	X	.	X	

<i>Worth Exploring</i> (4 items; 2 additional items)				
PI-99-AE Original Items	Intensifier (bolded)	Downtoner (italicized)	Colloquial Phrase (underlined)	Translation Notes
Unfamiliar things and places are <i>usually</i> worth trying or <u>checking out</u> .	.	X	X	Definition: As in other subscales, items should not imply <i>why</i> things are in this case worth exploring (e.g., morality, utility) but <i>that</i> things are worth exploring. Types of rewards for exploring (e.g., fun, meaning,) must remain unspecified.
I feel everything is worth trying, learning about, or exploring further.	.	.	.	Language: “To be honest” is a colloquial phrase indicating disclosure of perhaps unpopular opinions. It encourages agreement with something respondents normally might not feel comfortable agreeing to. The second item might be deemed triple-barreled, but this was done intentionally to illicit the general idea.
Everything deserves to be explored.	.	.	.	Ceiling: Forward-scored items suffered from ceiling effects. We suggest making them harder to agree with and reverse-scored items relatively easier to agree with, as done here or more so.
Recommended Additional Items				
Trying new things is <i>sometimes</i> worthwhile but <i>usually</i> disappointing.*	.	X	.	
Everything is worth trying <i>at least once</i> .	.	X	.	
Additional Primary and Secondary PI-99-AE Items				
<u>On the whole</u> , the world is an uncomfortable and unpleasant place.*	.	X	X	For the overall <i>Good</i> world belief scale
<u>No matter where</u> we are or what the topic might be, the world is fascinating.	.	.	X	For <i>Enticing</i> world belief
<u>No matter</u> where we are, incredible beauty is <u>always</u> around us.	X	.	X	For <i>Enticing</i> world belief

Lessons Learned from Initial Translation Efforts

Many of the above insights were unearthed—and their importance made obvious—by the first two primals translation efforts. While providing insight for other translators, note that both translation efforts were in WEIRD populations (Henrich et al., 2010) and largely aimed to confirm the dimensional structure of the PI-99-AE rather than explore the possibility that radically different primals or structure may be a more natural fit.

German Translation Process

The German translation team adapted the PI-99-AE following the standardized translation-back-translation procedures outlined by Beaton and colleagues (2000) and van de Vijver and Hambleton (1996). While the process is detailed in Stahlmann and colleagues' (2020), here we will focus on challenges and insights applicable to other translators. An original author participated in the expert committee, provided feedback on the back-translated items' content equivalence and difficulty, and rated all items using a five-point rating scale (*perfect, good, fine, maybe not ok, not ok*). The translators reviewed all items that were not rated *perfect, good, or fine* and revised most of them vis-à-vis the expert's comments. An overview on the adaptation process including the expert's feedback and ratings can be found in the original supplementary material (Stahlmann et al., 2020, Table S1). We believe the feedback and ratings greatly contributed to consolidating the content validity of the final German Primals Inventory. Still, translation and back-translation inevitably fails to remove all item-level error, and, if researchers have not worked with primals before, it can be especially hard to capture the intended content and difficulty, which is fairly unusual. In addition to including methodologists, language professionals, and translators, we stress the importance of the above recommendation to include a primals expert in the committee.

The research team also consulted native speakers from the three largest German-speaking countries (Germany, Austria, and Switzerland). We did this to ensure that the items would be understood correctly in all three countries, in which regional dialects play a huge role. While German (standard German; as spoken in some parts of Germany) is the official written language in all three countries (or, in the case of Switzerland, one of four national languages), Swiss German is a family of German dialects, which not only varies in vocabulary, but also in semantics, syntax, and phonology (this is also true for dialects spoken in Austria and Germany; e.g., Christen, 1998; Gibbon, 1998). These dialects may influence the way standard German sentences and terms are understood, and, in the worst case, the dialect background may hinder the understanding of standard German words as they are either not used or simply nonexistent in a particular dialect. If regional dialects play a role in your target language, we likewise suggest involving native speakers with different dialect backgrounds throughout the adaptation process (Vogt, King, & King, 2004). Different dialects can be addressed in Stage IV (expert committee review) of Beaton and colleagues' (2000) process, but our experience shows that already considering them in Stage I (Translation) and Stage II (Synthesis) will greatly facilitate the whole adaptation process.

After translating the PI-99-AE into German including no additional items (the strategy of identifying an additional 1-2 items per primal had yet to be formulated), the team investigated the items' interrelationships and explored their factor structure in a German-speaking sample of participants from Germany, Switzerland, and Austria. In general, items performed as expected, which is remarkable given the PI-99-AE's complex measurement model. However, correlation and exploratory factor analysis showed that some tertiary primals' items yielded surprisingly weak relationships with their designated scales but sustained, strong relationships with other

tertiary primals (e.g., *Interesting* item *It feels like interesting and exciting things surround us all the time* was connected more strongly with *Abundant* and *Beautiful* than *Interesting*). We think these emerging issues may reflect subtle but nevertheless important differences in the structure of primal world beliefs between American English and German-speaking subjects—perhaps worthy of more extensive explorations down the road. Concerning the above *Interesting* item, German-speaking participants seem to be responding less to the idea of *interesting and exciting things* and more to the phrase *surround us all the time*, which could be considered a marker of the world's abundance. Indeed, given that both *Abundant* and *Interesting* are strongly related to the secondary primal *Enticing*, we assume that such differences pertain to items that are strongly saturated by their respective secondary primal.

Eventually, we decided to omit such items from the German Primals Inventory in order to parallel the 22 tertiary primals' factor structure with the PI-99-AE; we excluded 33 items to arrive at the final version of the inventory, the PI-66-G. This led to the exclusion of many opposite-scored items and resulted in some scales being either entirely forward-scored (e.g., *Interconnected*) or reverse-scored (e.g., *Acceptable*). Fortunately, excluded items were often those marked by high endorsement and thus had previously contributed to ceiling effects, which may have been partly why they did not load on expected tertiary factors (the supplemental table providing item-level advice on intensifiers and downturners was not yet created). The ensuing factor analysis showed that remaining items yielded strong connections with their designated scales and that the higher-order structure was similar to the structure reported by Clifton and colleagues (2019). Interestingly, in addition to finding the primary primal *Good* and secondary primals *Safe*, *Enticing*, and *Alive* in our data, the research team found three new secondary primals labeled *Fluid*, *Communal*, and *Empowering*. We are interested if other translation efforts

find these or other new secondary primals. It may be that *Good*, *Safe*, *Enticing*, and *Alive* are universal but can be accompanied by other more culturally-specific secondary primals.

In sum, major takeaways from the German translation process include the value of (a) engaging a primals expert during the translation, back-translation, and adaptation process, to provide feedback and help ensure the preservation of the items' intended meanings; (b) involving native speakers of each target dialect throughout the process; (c) paying close attention to downturners and intensifiers; (d) including additional items in the initial translation pool as this guide suggests to ensure that there are sufficient well-performing items for reliable subscales; and (e) analyzing the overall structure with an eye for potential, culturally-specific secondary primals. The German effort demonstrates that even the most rigorous translation and adaptation process can result in items that account for unexpected effects and relationships. Though in this case subscales remained internally reliable after the exclusion of items, this cannot be guaranteed in further translation efforts given the minimal length of PI-99-AE subscales. The importance of translating 1-2 additional items per subscale cannot be overstated.

Italian Translation Process

The Italian translation team completed the PI-99-AE adaptation process following the guidelines provided by Borsa and colleagues (2012) and with the supervision of two original primals authors. First, two bilingual translators (two native Italian speakers with one an expert in cognitive psychology) translated all PI-99-AE items, including additional items, into Italian. Each item translation was then tested in a pilot study involving 14 Italian participants (age 18 to 46 years old; education from high school to Master's degree). All participants were required to report the appropriateness, accuracy, and understandability of each item following guidelines from Borsa and colleagues (2012) on a dichotomous response scale (i.e., present vs. absent). Pilot

subjects also suggested ways to improve items. Participants were prompted to flag items that were formulated with unusual or uncommon phrasing even if the item was understood. The research team found approximately 40% of translated items were being consistently interpreted in problematic ways, reinforcing the above recommendation that piloting is critical. The team therefore pursued face-to-face interviews with our pilot participants to examine face-validity and rephrased these items according to their suggestions. It is notable that, despite some error at the item level, all participants interviewed were able to understand the instrument's aim. This suggested to us that the primals construct—especially the idea that the basic character of the world as a whole is a psychologically meaningful object of belief—is understood intuitively by many as a natural schema category. Finally, the team prepared a back-translation of all items reviewed by two of the original authors of the PI-99-AE. They provided item-specific feedback on difficulty and meaning as well as ratings on a 5-point scale (*excellent, good, acceptable, questionable, unacceptable*).

Italian, like most languages, is multifaceted and can convey slight shades of nuance. As a result, a key challenge for each item was to find the right syntax to preserve the item's intended meaning. We chose largely to follow a strict translation of the PI-99-AE items, which we thought would be helpful to avoid item overlap and to ensure we did not alter the original meanings (the strategy of cultural adaptation and interpretation had not yet been recommended by this guide). Even colloquial American English expressions, though pleonastic in Italian, such as “To be honest” (trans. *Per essere onesto*), were maintained. Yet this approach presented some unexpected interpretation issues among pilot participants. For instance, the Interconnected item *Though things can appear separate and independent, they really aren't. Instead, all is one.* (trans. *Anche se le cose possono sembrare separate e indipendenti, in realtà non lo sono. Al contrario,*

sono un tutt'uno.) was perceived by most pilot participants to be a religious statement rather than a general, areligious observation of the world. It is possible that this interpretation is due to pervasive religious education in Italy. To counter this in the Italian context, in the future we may include supplemental scale instructions.

In sum, major takeaways from the Italian translation process to date include the value of (a) item adaptation rather than strict translation; (b) including a primals expert during the translation, back-translation, and adaptation process, to provide feedback and help ensure the preservation of the items' intended meanings; (c) item piloting; and (d) identifying especially unwanted subscale-specific connotations.

Priority Concerns

Productive psychological research—not to mention peaceful human cooperation—requires perspective-taking. Thus, establishing an accurate, descriptive understanding of how others see the world is fundamentally important, especially among peoples who may talk differently, worship differently, and live far away. Primals research can help bridge this gap but only if measures can be created that are valid for these different cultural contexts—the task of the Primals Inventory translator/adaptor. This guide has discussed various particular difficulties that may arise when translating the Primals Inventory which generic scale guidance does not address. In closing, it may be useful for prioritization purposes to highlight among our many suggestions the top three that deserve of special attention. These concern (a) carefully translating *the world* in ways tailored to each primal and item; (b) calibrating item difficulty differently for different subscales; and (c) initially administering one or two additional items per tertiary subscale. Instead of being onerous, we hope that translators find these suggestions clarifying and impart greater

confidence that translation efforts will succeed in their goal of yielding valid and equivalent measures of primal world beliefs.

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