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Abandoning the language of “response shift”: a plea for conceptual clarity in distinguishing scale recalibration from true changes in quality of life

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Abstract Quality of life researchers have been studying “response shift” for a decade now, in an effort to clarify how best to measure QoL over time and across changing circumstances. However, we contend that this line of research has been impeded by conceptual confusion created by the term “response shift”, that lumps together sources of measurement error (e.g., scale recalibration) with true causes of changing QoL (e.g., hedonic adaptation). We propose abandoning the term response shift, in favor of less ambiguous terms, like scale recalibration and adaptation.

Keywords Response shift · Hedonic adaptation · Scale recalibration · Validity

Introduction

In 1999, *Social Science and Medicine* published a series of articles on the methodological importance of understanding

response shift in quality of life research [1–7]. Since that time, researchers have published more than 100 studies exploring various aspects of response shift [8]. As a consequence of this work, quality of life researchers have become increasingly aware of issues relevant to the measurement of quality of life over time. Response shift experts have drawn researchers’ attention to sources of bias in quality of life estimates. They have shed light on important mysteries relevant to understanding the experience of people with chronic illness and disability [9]. And they have focused researchers on the challenge of explaining why people with disabilities often provide quality of life reports that seem to belie their objective circumstances [10].

But it is time to abandon the term “response shift.” As we explain below, the term response shift is currently being used to lump together distinct phenomena that often have very different implications for the accuracy of quality of life measurement. Moreover, the specific term “response shift” has misleading connotations. The term suggests that the high quality of life reported by many people with chronic illness and disability are measurement artifacts—their “responses” have “shifted”—and that such people are not really experiencing high quality of life. We think such connotations, even if not originally intended, are misleading.

A major goal of QoL measurement is to discern to what extent changes in QoL reports over time represent true changes in QoL and to what extent they reflect measurement error. Unfortunately, the response shift literature often fails to make this important distinction. At times, the term response shift is equated with measurement error, while at other times, the term is used to characterize a mechanism by which people’s true QoL changes.

In this paper, we respectfully contend that the field of response shift research has been characterized from its

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outset by conceptual confusion. We propose that QoL researchers should abandon the term response shift and focus instead on developing ways to disentangle measurement error—specifically scale recalibration—from true changes in QoL.

Two examples of response shift: hypothetical case studies

To illustrate our central concern about the term response shift, consider the following two hypothetical case studies. We use these oversimplified cases to elucidate our distinction between measurement error and true change.

Happiness after paraplegia

The first case involves a man who develops paraplegia as a result of an accident. Early on, he is emotionally devastated by his disability. But over time, he begins to recover. In part, his recovery is aided with the help of physical therapists and occupational therapists, who teach him how to engage in important activities, like getting in and out of a wheelchair and driving a car. Yet despite these advances, several months after the accident, he remains unhappy.

But after many months, his mood improves. He no longer spends time focusing on what he cannot do. Instead, he shifts his attention toward new goals, such as participating in wheelchair basketball tournaments. He even gets more involved in church, reestablishing a spiritual life that had slipped away from him before his accident.

Even though his physical function is stable by all objective measures, his emotional response to his disability has abated. Eventually, his mood is close to what it was prior to the accident. Indeed, for the purposes of our discussion, let us assume that emotion researchers have videotaped this man's facial expressions over time and confirmed that in the early months after his injury, he rarely smiled and frequently frowned, but over time his face revealed an increasing percentage of time experiencing positive rather than negative emotions [11].

Let us suppose that QoL researchers have been surveying this man over time. As part of a multi-dimensional QoL scale, they ask him to provide a global report of his overall QoL, on a 0–100 scale. Several months after his accident, he rates his QoL as 36/100, a very low score. By eighteen months, his self-reported QoL has risen to 67/100.

A person with chronic pain who experiences kidney stones

In our second case, we ask you to imagine a thirty-year-old woman who suffered a leg wound while serving in the

armed forces and has experienced chronic leg pain ever since. The pain interferes with her sleep and makes it difficult for her to concentrate. She rates the pain on average as being 7/10 most days. Then, this woman experiences kidney stones, with pain significantly more intense than anything she has previously experienced, 10 out of 10. Indeed, she cannot believe that she thought her leg pain qualified for a score as high as 7 out of 10.

After her kidney stones are treated, her life is unchanged. Her leg pain continues unabated. A researcher monitoring her facial expressions records that she exhibits just as many grimaces of pain now as she did before her kidney stones. Her leg pain, in other words, is exactly the same. But now, her interpretation of this 0 to 10 pain scale has changed. She has a very different idea about what a pain score of 10 means. Therefore, when asked to rate her leg pain now, she replies that it averages about 5/10.

Viewing these case studies through the lens of response shift

These two hypothetical studies carry quite different implications for the measurement of subjective experiences like QoL and pain. In the first case, QoL measurement appears to have accomplished exactly what researchers want it to accomplish—it has captured the true change in QoL that this person experienced when he emotionally adapted to his chronic disability [12]. In the second case, however, a person with stable pain reported a change in her pain score. And yet her pain had not changed. In this case, the pain measure failed to provide us with a valid way of comparing this person's pain over time.

In the first case, a person emotionally adapted to a chronic disability and thus reported a change in QoL. In the second case, a person recalibrated the pain scale and thus, despite experiencing stable pain, reported a changing pain score. Two very different phenomena. And yet *both* stand as examples of response shift.

Admittedly, these two cases are not only hypothetical, but also relatively simplistic, lacking the complexity of actual patient trajectories. In addition, both cases make reference to unidimensional measures (of QoL and pain, respectively), whereas many actual measures are multidimensional. Nevertheless, these cases are meant to illustrate our main point: that response shift lumps together quite distinct, and potentially distinguishable, phenomena, ones that seem better off separate than lumped together. (We expand on this argument below.) In addition, the issues we raise with these hypothetical cases are not limited to unidimensional outcome measures. Indeed, many multidimensional measures contain items within that are susceptible to the same phenomena illustrated above, phenomena like adaptation and recalibration.

Our concern is that these two cases came to be lumped together under one rubric, of “response shift.” To understand how this lumping has occurred, we need to look more closely at how experts have defined response shift.

Defining response shift

Sprangers and Schwartz define response shift as:

A change in the meaning of one's self evaluation of a target construct as a result of: (a) a change in the respondent's internal standards of measurement (scale recalibration, in psychometric terms); (b) a change in the respondent's values (i.e. the importance of component domains constituting the target construct); or (c) a redefinition of the target construct (i.e. reconceptualization) [2].

They pack a great deal of meaning into this description, so it is worth unpacking their definition.

Scale recalibration

The first component of response shift, scale recalibration, occurs when changing circumstances cause people to change how they interpret a subjective response scale. In our hypothetical example, the woman with chronic leg pain exhibited scale recalibration—her experience of kidney stones changed how she interpreted the 0 to 10 pain scale.

Scale recalibration is a threat to the validity of self-reports. For example, imagine an 85-year-old man who rates his health as 90 out of 100 on a scale where 100 is defined as “perfect health.” Imagine a 35-year-old man who also rates his health as 90 out of 100. How confident would you be that the two men mean the same thing by 90 out of 100?

In a survey of people 50 or older in the United States, we found evidence for scale recalibration in how people interpret the phrase “perfect health.” [13] We discovered that as people get older, they redefine what perfect health means. This makes it difficult to compare subjective health ratings across people of different age groups. By similar logic, it is possible that people who experience chronic illness or disability will redefine what it means to have “high” levels of happiness or “7 out of 10” quality of life.

Change in values

Quality of life reports can also be influenced by how people's values change in response to their circumstances. For example, imagine that soon after developing paraplegia, a person is despondent, because he has to give up physical activities that mattered a great deal to him. But

over time, his values change. He places a higher value on intellectual pursuits than on physical activity. And with that change in values, comes a change in his self-reported quality of life.

Changing values can be a mechanism by which people emotionally adapt to illness or disability [14]. For example, a study of patients with prostate cancer who had experienced treatment side effects showed that those men who were able to change their values, by shifting what was important in their lives, were able to maintain a high QoL in the face of treatment complications, whereas those men who did not change their values experienced a decline [15].

Note that by changing values, people exhibit response shift, but this cause of response shift does not necessarily invalidate QoL measures. By contrast, scale recalibration is by definition a threat to the validity of QoL measures. A person who recalibrates a scale makes it hard for researchers to compare one self-report to another. But a person who changes her values has not necessarily invalidated her QoL reports. Instead, changing values in this way can simply be a mechanism by which people gain true changes in QoL.

Reconceptualization

A third component of response shift is reconceptualization of the construct being measured. Reconceptualization is a challenge for QoL measurement, because the meaning of QoL is broad, and therefore can be interpreted differently by different people and, of even more concern, can be interpreted differently by the *same* person at two points in time.

For example, prior to experiencing an illness, a person may evaluate his QoL primarily on affective or emotional grounds. By this interpretation, he would provide a high QoL rating only if the frequency and intensity of positive affect in his moment to moment life significantly outweighed the frequency and intensity of negative affect [16]. But in response to his illness, he may care less about his mood and place more importance on the frequency with which he pursues meaningful activities [17]. What does reconceptualization mean for the validity of QoL reports? The answer is not clear. If we want people to freely interpret QoL (or happiness, or well-being), then reconceptualization is not a threat. However, if we want them to judge their QoL at any given time using the exact same definition of QoL, then this is a threat, and we need either to find ways to prevent such reconceptualization or, instead, to develop methods to discover whether such reconceptualization is influencing people's self-reports.

For example, it is plausible that people adapt to chronic illness or disability in part by changing their values. Prior to an illness, a person might consider athletic activity to be

an important component of his QoL. After being sick, he may think of QoL in different ways, no longer feeling that a vigorous workout is key to the good life. His life goals and values may migrate from physical recreation to intellectual pursuits. Indeed, this change in values may even lead him to redefine what it means to have good QoL (hence, showing the subtleness of the distinction between the second and third parts of Sprangers' definition of response shift).

Problems with the current conceptualization of response shift

Based on Sprangers' definition, response shift can occur through several mechanisms, some of which raise fundamental questions regarding the validity of self-reported QoL, but others which do not.

Connotation that response shift is always a threat to validity of self-reports

The way response shift is defined, a phenomenon like scale recalibration—a true source of measurement error—is lumped together with other phenomena that do not necessarily create measurement error. Unfortunately, the term “response shift” conjures connotations that more clearly resemble scale recalibration than the other phenomena. Consequently, some people have mistakenly assumed that response shift is always evidence that QoL measures are not valid. For instance, Brossart and colleagues describe response shift as a “threat to validity of outcome data.” [18] Wilson writes about distinguishing “between true change (which here is called a “shift”) and scale recalibration, concept redefinition or a change in values (“response shift”).” [7] In other words, Wilson believes response shift is pseudo change, not true change. Similarly, in introducing medical researchers to response shift, Schwartz and Sprangers state that when response shift occurs: “answers to the same items by the same individual may not be as comparable as originally thought.”

In a longitudinal study of people with multiple sclerosis, Schwartz and colleagues continue this line of reasoning:

The apparent stability in these QoL outcomes over five years of follow up might be considered a gain from the perspective of optimal rehabilitation. Our data suggest that this “gain” [their quotation marks] may reflect recalibration and reconceptualization response shifts...Thus, overall patients' QoL conceptualizations seemed to reduce an emphasis on physical functioning and increase an emphasis on psychological well-being [19].

This quote implies that the QoL of people with multiple sclerosis is a measurement artifact, because people have found happiness by changing their life goals. Clearly, to understand the QoL of people with chronic illness or disability, it is important not only to know what their overall quality of life is, but also to understand what they mean by quality of life. It is valuable to determine whether the things they value in their lives have been changed by their experiences. But to lump all of these together under one header, “response shift,” and to then imply that high reported quality of life is not to be trusted, is not justifiable. The problem, once again, is that the term “response shift” carries a specific connotation—that the self-reports of people with chronic illness and disability are misreports. Yet when people find happiness by shifting their values, their high self-reported QoL may simply reflect that they have a good QoL!

Identification of response shift with the “then test”

Why do people believe that response shift does not reflect true change? One possible reason, as we have suggested, is that the term response shift carries connotations that fit much better with scale recalibration than with the other two components of response shift. In fact, the term response shift was initially used in the educational literature in the 1970s and was specifically limited to the concept of scale recalibration.

There is another reason, however, why researchers often equate response shift with measurement error—because they have too often relied on the Then Test to determine whether a QoL self-report is being influenced by response shift [8]. In the Then Test, researchers collect at least three data points: (1) a baseline or “Time 1” measure of QoL; (2) a “Time 2” measure of QoL; and (3) a “Then” measure of QoL—a retrospective assessment at Time 2 of what one's QoL was at Time 1.

For example, imagine a patient with chronic 7/10 pain at Time 1, who receives a new treatment for his pain and at Time 2 reports experiencing only 5/10 pain. Without conducting a Then Test, many researchers would conclude from these data that this patient experienced a 2 out of 10 reduction in his pain. But suppose the Then Test reveals that this patient now judges his Time 1 pain as having been 9/10. This suggests that the patient has reinterpreted what the points on the pain scale mean. The patient is telling us that he experienced a 4 out of 10 reduction in his pain (from 9 to 5), according to his new interpretation of the pain scale.

In the next section, we will explain why we believe people are misinterpreting the Then Test. But for our present purposes, we merely want to establish that the vast majority of researchers, when studying a response shift,

have focused on the Then Test and have therefore equated response shift with scale recalibration. Response shift means, for most people, the same thing as scale recalibration, and so when they find evidence of response shift, they assume that they have found evidence of measurement error.

Misinterpretation of the Then Test

As we have explained, response shift is primarily identified by use of the Then Test. This reliance on the Then Test is troubling, because most researchers misinterpret the data from this test, by assuming that if the Time 1 measure differs from the retrospective measure, then patients must be recalibrating the outcome scale. By making this false assumption, researchers have been downplaying the likelihood that the retrospective measure is being influenced by recall bias [20].

People's theories about how a life domain is supposed to have changed over time can bias their retrospective reports about those very domains. For example, Ross conducted a study in which he assessed people's study skills, by an objective measure of such skills. He also had people provide self-reports of their own study skills. He found at baseline that people had very good insights into their study skills—a person who was, say, 6/10 on a study skills score typically perceived himself as being a 6/10. Then, Ross followed these students after they took a course designed, purportedly, to improve their study skills. As it turns out, the course had no effect at all on people's study skills. A student who began with study skills of 6/10 would typically end up with study skills of 6/10 at the end of the course. When Ross reassessed these people's study skills, he demonstrated that the course had failed, and he also found that students still had accurate perceptions of their own study skills. A student who was still 6/10 typically perceived himself as being 6/10 [21].

But here is the catch: at the end of the course, Ross asked the students to recall what their study skills had been before they began the course. Students had a theory that this course would improve their study skills. So at the end of the course, a student who accurately reported himself as having study skills of 6/10 would typically “remember” that he began the course with study skills of only 3 or 4/10. The students, in other words, misremembered their previous study skills, because their memory was influenced by their theory about how their study skills should have changed over time.

In this example, students did not exhibit any scale recalibration. Their Time 1 and Time 2 self-reports were entirely accurate. Yet, response shift researchers, relying on the Then Test, could potentially look at these same data (in the absence of objective measures of study skills) and

conclude that response shift had occurred—that people had recalibrated the study skills scale. Our research team has found a similar theory-driven recall bias affecting people's beliefs about how their happiness has changed over their life span [22]. We have also shown that recall bias influences patients' assessments of how much they have benefited from kidney transplantation [23].

The key point here is that the Then test is not able to distinguish between scale recalibration and recall bias, two distinct phenomena.

Lumping instead of splitting

The most fundamental problem with the term response shift is that it lumps together distinct phenomena, and in doing so makes it harder for researchers to disentangle scale recalibration from true change.

Response shift theorists are correct to note that multiple phenomena could be simultaneously influencing people's subjective self-reports. A person's pain score over time may be influenced by both scale recalibration and true change; her retrospective report might simultaneously be influenced by both scale recalibration and recall bias. Leaders in response shift theory have advanced the field by drawing attention to those important phenomena. But for the field to reach its potential, the time has come to disentangle these phenomena. And we believe this disentangling will move forward more quickly if researchers adopt more precise language.

Where do we go from here?

QoL researchers want to know when their measures are reliable, valid, and comparable within people across time. When patients receive healthcare interventions, or experience changes in health, researchers want to know what it means when their QoL scores also change. Researchers also want to know whether these changes are real or instead reflect measurement bias.

We think that conceptual confusion around the concept of response shift has impeded researchers in pursuing these important goals. We suggest the following to address this problem:

“Abandon response shift”

To achieve this goal, researchers need to abandon the term “response shift.” The term is simply too confusing to help researchers disentangle these very complicated issues. The language and definition of response shift impedes research by lumping together sources of measurement bias—scale recalibration—and other phenomena—like change in

values—that may simply reflect mechanisms by which people experience true change.

Use precise language

In place of response shift, researchers should use more precise language to characterize the specific issues they are assessing. Scale recalibration, for example, has a more precise and narrow connotation than response shift. By definition, scale recalibration is an example of measurement bias. If scale recalibration has occurred, researchers can be confident that measurement bias exists, and therefore that the measures are not comparable over time. If response shift has occurred, however, researchers do not know whether QoL measures over time are comparable or not.

Other terms exist in the scientific literature that capture other relevant phenomena currently lumped together under the concept of response shift. For example, emotional adaptation, or hedonic adaptation, is a term used by psychologists to characterize true changes in subjective well-being or happiness over time, when people's emotional reaction to changing circumstances weakens [12, 24]. We predict that if researchers set out in advance to identify whether a specific change in QoL is a result of scale recalibration versus adaptation, they will be much more likely to generate useful research results than if they simply set out to determine whether the measurement reflects the more ambiguous concept of response shift.

Move beyond the Then Test

Researchers should not rely on the Then Test to reveal whether scale recalibration has occurred. The causes of Then Test discrepancies are too ambiguous to lay out solely at the feet of scale recalibration. Discrepancies between time 1 measures and recalls of time 1 *could* result from scale recalibration, but could also result from recall bias. In place of the Then Test, researchers should use other methods to test for scale recalibration. We presented one such method in this article, when we discussed how scale recalibration influences people's interpretation of "perfect health" as a function of their age. We elaborate on other methods elsewhere [25].

More careful review of response shift research:

Journal editors and reviewers should look carefully when scrutinizing studies that explore the concept of response shift. They should look to see whether the study focuses solely on scale recalibration. When it does so, they should ask the researchers to rewrite the study using more precise terminology. If they note that the researchers are using the

Then Test as the sole evidence of scale recalibration, they should make sure the authors indicate that other phenomena, like recall bias, could be influencing their results. And when the research focuses on how things like change in values can lead people to experience true increases in their quality of life, they should ask authors not to call this an example of response shift, but instead to use other appropriate terminology, such as adaptation or resilience.

Concluding remarks

We expect that the ideas we present here will be controversial. Some scholars have made reputations for themselves by disseminating the concept of response shift. But the long-term success of QoL research depends on researchers striving for precision and clarity in their work. Concise, specific terminology is an important part of this research enterprise.

Response shift experts have done a worthy job of drawing scholars' attention to important issues like scale recalibration and adaptation. They should be commended for generating so much interest in these important topics. Now, however, it is time for QoL researchers to abandon the term response shift and focus their efforts on determining when they can trust the comparability of their QoL measures across time.

We recognize that our article raises more questions than it answers. Future research should explore better ways to empirically disentangle some of the concepts we identify in this manuscript. But our goal in this article is not to show the field how to disentangle all these complex issues. Instead, we have set out to demonstrate that, by lumping distinct phenomena under a single term, response shift, we make it that much harder for researchers to begin to disentangle these distinct phenomena.

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