

# On Defining Subjective and Objective Measurements

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The adjectives “objective” and “subjective” frequently precede the noun “measurement,” but all too often the terms are used without precision. Kerlinger has described objective measurements in terms of reliability. He states, “An objective procedure is one in which agreement among observers is at maximum. In variance terms, observer variance is at a minimum.”<sup>1</sup> Therefore, an objective measurement is one in which there is reasonable intertester (interobserver) reliability. Kerlinger even describes a strategy that can be used to increase the likelihood of obtaining objective measurements:

Objective methods of observations are those in which anyone following the prescribed rules will assign the same numerals to objects and sets of objects as anyone else.<sup>1</sup>

All too often the term objective is applied to a measurement that someone thinks highly of, whereas subjective is used in a derogatory fashion to demean a measurement. But it is my impression that rarely are these terms being used to reflect the reliability of the measurement. Rather, the terms are used to reflect the bias of the person using the term. Consider how the term subjective has become distorted

in some uses of the problem-oriented record or with SOAP (subjective, objective, assessment, plan) notes. Some people consider anything that the professional states or observes to be objective, whereas any report by the patient is considered subjective. I submit, for example, that when a patient tells a therapist that he has had a lower extremity amputation, that statement should not be listed under subjective data.

In the past, I have made the argument that an objective measurement is a reliable measurement.<sup>2</sup> Perhaps I did not make a good case because bizarre uses of the term persist. For example, I hear people say that they have abandoned muscle testing in favor of the use of instruments because the latter is objective. But, unfortunately, such statements are almost never accompanied by supporting evidence in terms of reliability data. Apparently the pejorative uses of the terms subjective and objective include the notion that instrument-obtained measurements are objective but those obtained by a human observer are inherently subjective. This notion is tragic because it not only misrepresents the facts but also limits what therapists can do. By adhering to sloppy definitions, we handicap practice.

To determine whether a measurement is objective, one needs to assess the reliability of the measurement. Therefore, because reliability estimates indicate the error in a measurement, subjectivity represents error. Despite attempts at finding shortcuts for evaluating reliability estimates, it is counterproductive to state that a measurement is or is not reliable. Rather, it is useful and theoretically correct to state that a measurement has a degree of error associated with it.

The amount of tolerable error in a measurement depends on how the measurement is used. A measurement with a 50% error could still be useful in detecting changes greater than 50%. Measurements with poor reliability may lack a high degree of precision, but if they are carefully used, they may be salvageable. The issue is not to treat reliability and objectivity like an action potential. Reliability is not an “all-or-none” phenomenon; therefore, subjectivity and objectivity cannot be all-or-none phenomena.

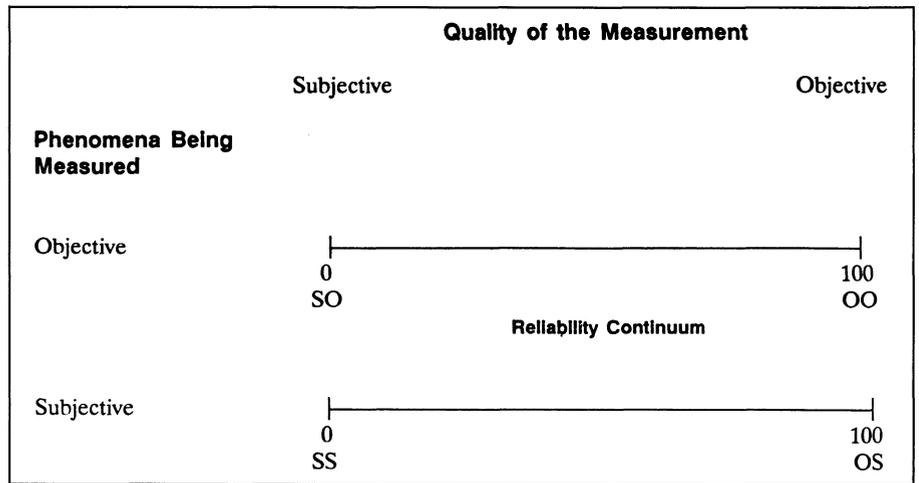
Before we characterize a measurement as objective, we need to assess its reliability with research. “High-tech” measurements are not necessarily objective, and “low-tech” measurements are not necessarily subjective. Each measurement has a degree of error associated with it, and in clinical decision making that error must be known if intelligent decisions are to be made. A failure to consider the

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error in a measurement has led to some counterproductive jargon within our profession. Manual therapists can be overheard saying that by use of their tests they have “cleared the neck” and, therefore, the patient’s pain must be from other structures. To contend that one has “cleared” the neck implies absolute certainty. The statement leaves no room for doubt, no cause to consider the error associated with the measurements, and no need to keep in mind that the problem may really be due to structures in the neck.

Perhaps one reason why the terms objective and subjective are so often misused relates to a failure to understand what these adjectives relate to. A measurement may be objective or subjective. That means it may or may not have a reasonable level of intertester reliability. Here the adjective relates to the quality of the measurement, not to the phenomenon being measured. The adjectives objective and subjective may also be applied to the phenomenon (variable) being measured (Figure). For example, pain is a subjective phenomenon, but it may be measured reliably. Therefore, we can have an objective measurement of a subjective phenomenon (OS on the Figure). In contrast, we can measure the rotary forces produced by muscle contractions. This physical entity is certainly objective in nature, but if we measure it in a way that has poor reliability, we have a subjective measurement of an objective phenomenon (SO on the Figure).

Measurements of choice are objective measurements of subjective and objective phenomena. Measurements of dubious value are subjective measurements of objective and subjective phenomena. By understanding that we can measure both objective and subjective phenomena reliably (objectively), we free the clinician to measure really important variables. Proper use of the terms should not inhibit clinical practice, but rather should enhance clinical decision making by allowing therapists to measure phe-



**Figure.** Illustration of the relationship between the quality of a measurement as being subjective or objective (in terms of reliability) and the phenomenon being measured (as being either subjective or objective). The scales indicate that objectivity of a measurement (reliability) lies along a continuum. For example, a subjective phenomenon may be measured subjectively (SS) or objectively (OS).

nomena that are highly meaningful to their patients.

I am advocating that we rethink how we use the terms objective and subjective, but I do not mean to imply that a measurement only needs to be objective. A measurement may be objective (have suitable reliability), but it may offer little information for decision making. A useful objective measurement must be valid; that is, it must be useful for some meaningful inference. Ideal measurements are objective measurements that have been shown to be valid for some inference. Without evidence that a measurement can be used to make inferences, a measurement has no basis for being used in the clinical decision-making process.

In considering how we use terms, I have come to a personal conclusion based on observations of outstanding clinicians. Good clinicians may not always be aware of reliability coefficients, but during their practice they have somehow gleaned some insights into the errors associated with their measurements. They appear to almost intuitively take into account the possibility that their measurements may be error-ridden. They know when to second-

guess their measurements or to take other measurements. I do not believe that they actually are doing this intuitively, but rather they do this because of their experiences. Unfortunately, it appears to be due to intuition, and as a result the clinician and observers cannot understand how the experts know when to doubt the results of their measurements. Because the process appears intuitive, novice clinicians cannot learn this process by observing experts.

There is a clear challenge to the educational community. We must stop the simplistic practice of characterizing measurements as being subjective or objective. A dichotomy simply does not exist. We must teach the new practitioner how to deal with uncertainty. Too many students feel that clinical decisions need certainty. In reality, clinical practice is not that simple. We do not withhold treatment until reliable measurements are available, but rather, based on less-than-perfect measurements, we make educated guesses as to the best possible strategies. In making these guesses, however, we must keep in mind the possibility that we might be in error, and we must

have a means for testing our guesses.

Uncertainty may not be a welcome companion in the clinic, but we must deal with it like we deal with any unwelcome guest. We need to keep our eyes open and be wary of the consequences.

I want to summarize my main arguments. The terms objective and sub-

jective must be used with caution. We must know whether the terms apply to the quality of a measurement or to the thing being measured. We must also consider the degree of objectivity (reliability) for a measurement when we make clinical decisions. Uncertainty must be considered when measurements are used. To err may be human, but to think measurements are unerring is neither divine nor good practice.

## References

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- 2 Rothstein JM: Measurement in clinical practice: Theory and application. In Rothstein JM (ed): Measurement in Physical Therapy: Clinics in Physical Therapy. New York, NY, Churchill Livingstone Inc, 1985, vol 7, p 1