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Determining Cutoffs for the Psychometric Synonym Analysis to Detect IER

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DETERMINING CUTOFFS FOR THE PSYCHOMETRIC SYNONYMS ANALYSIS TO DETECT IER

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I HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER MY SUPERVISION BY Tyler Barnes ENTITLED Determining Cutoffs for the Psychometric Synonym Analysis to Detect IER BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Doctor of Philosophy.

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Abstract

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The validity of individual responses is required for valid inferences drawn from data. Insufficient Effort Responding (IER; Huang, Curran, Keeney, Poposki, & DeShon, 2012) is one possible threat to individual response validity. There are many methods to detect IER, but the Psychometric Synonyms Index, despite its practical utility, is understudied. The purpose of this study is to provide recommendations for its use that are empirically grounded. Using a simulation, I found that the strength of the within-pair correlations used for inclusion into the index, the number of pairs, the type of random responding, the correlation between the pairs, the skewness of the data, and IER severity with an individual case have an impact on the psychometric index and by extension the cut-off one should use for classifying cases as IER or careful. Recommendations for the index depend on the situation.

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Determining Cutoffs for the Psychometric Synonym Analysis to Detect IER.

Ensuring data quality is essential for drawing valid inferences from data. Past research examining aberrant responding includes its effects on the internal structure of measures (e.g., Schmitt & Stuits, 1985; Woods, 2006), inferences drawn from data (e.g., McGrath, Mitchel, Kim & Hough, 2010; Stevens, 1984), and how to detect cases in which aberrant responding may be present (e.g., Meade & Craig, 2012, Karabatsos, 2003). There is increased interest in one type of aberrant responding: Insufficient Effort Responding (IER), which is also known as careless responding (Meade & Craig, 21012; Huang, Curran, Keeney, Poposki, & DeShon, 2012). IER is “defined as a response set in which the respondent answers a survey measure with low or little motivation to comply with survey instructions, correctly interpret item content, and provide accurate responses” (Huang et al., 2012, pp. 100). There are many different methods to detect IER to mitigate the effects of IER on data quality. However, not much is known about one method, Psychometric Synonyms, which has shown promise in being useful and simple to calculate. The purpose of this study is to learn more about this index and propose recommendations for its use. I will begin by discussing how IER can impact data quality in more detail. Next, I will discuss the forms of IER. Then, I will review the literature on the Psychometric synonyms index as a measure of IER.

IER’s Impacts on Data Quality

Prevalence

In the research about the base rate of IER within samples, findings include both low base rates (3.5%; Johnson, 2005) and high base rates (e.g., 60 – 73%; Baer, Ballenger, Berry & Wetter, 1997; Berry, Wetter, Baer, Larsen, Clark, & Monroe, 1992). Some report more in the middle such as about 5% (Maniaci & Rogue, 2014) and about 12% (Meade & Craig, 2012). Although these findings reflect only a sample of the studies assessing the base rates of IER, some conclusions can be made regarding the prevalence of IER, the size of base rates, and the impact of IER on data quality.

First, despite the variability about the prevalence of IER, it is an existing phenomenon. For example, the research that showed most people engaged in IER behaviors included a generous criterion for making that assessment by asking whether people engaged in IER on at least one item (Baer et al., 1997; Berry et al., 1992). Research showing a lower prevalence rate used a more conservative approach that likely included the cases detected by various IER indices. Barnes and LaHuis (2017) showed that even the best indices have low power rates when the severity of IER is low. Therefore, I posit that in the instances of low base rates, past studies likely include only cases which are severe. There is evidence to support that even just a small amount of IER can impact inferences drawn from the data. I will describe this in more detail later.

Second, the lack of agreement between the size of base rates suggests that IER rates may be unstable. Although few studies support this claim, it appears that certain situations can moderate the prevalence of IER. For example, participants frequently fill out self-report surveys online (Meade & Craig, 2012), which does not control for environmental distractions which may divert attention from the survey (Clifford & Jerit, 2014). In addition, self-report surveys' length can be a factor (Gibson & Bowling, 2017). Evidence also points to individual differences variables, such as personality, correlate with IER (Bowling, Huang, Bragg, Khazon, Liu, & Blackmore, 2016). Therefore, rates of IER could be affected also by sampling.

I also argue that in some situations, it may not be as viable to assume that IER is much of a problem (McGrath et al., 2010). Although they found a stronger case of inconsistent responding being an issue in applied assessment than other types of response biases, it was still a weak effect. I argue that in the case of applied, high-stakes, assessment, IER may not be adaptable. For example, in a selection procedure, it seems like the people applying would want to provide either honest response sets or fake response sets to make themselves look positive. The people who are likely to carelessly respond to assessments in this situation would probably want to dropout rather than devote energy to something that they do not care about. This would lead to non-response bias, not IER. Hough, Eaton, Dunnette, Kamp, & McCloy (1990) is one such example where they found little to no evidence of applicants distorting their responses. In that study, distorted responses included IER, but also had other forms of aberrant responding.

Regardless of these issues, IER remains a concern in self-report survey data (Meade & Craig, 2012; Karabatsos, 2003; Beach, 1989) since it is one of the most common ways to assess organizational constructs used for research and projects (Spector & Brannick, 2009). Understanding how IER affects self-report data and learning how to identify cases that contain IER would help to ensure the best quality data possible.

Inferences From Data with IER

IER can have an impact on the inferences drawn from data. It can impact correlations, and subsequently, reliability coefficients, CFAs, and regression estimates. Up to this point, researchers assumed that careless responding was a source of random error that attenuated correlations (e.g., Huang et al., 2012; McGrath et al., 2010; Meade & Craig, 2012). However, more recent evidence suggests that IER can strengthen correlations (Huang, Liu, & Bowling, 2014). Specifically, using simulated and empirical data, Huang et al. (2014) found that when scale means are different than the rating scale midpoint, the correlations between items increases. This may substantively impact most organizational research in which researchers and practitioners routinely use correlational methods to analyze data.

There is a similar pattern for reliability coefficients. Because IER attenuates correlations, most, if not all, reliability coefficients are attenuated due to random error. For example, Huang et al. (2012) found that IER decreased internal consistency. Although there is not any research that explicitly addresses careless responding and parallel/alternative forms or test-retest forms of reliability, I would expect the same result as stated above. If carelessness is random error, all of the coefficients associated with these forms of reliability would be attenuated by an increase in random error. However, I believe for there to be the possibility of increased reliability estimates depending on the type of IER and if IER increases the correlations between items.

IER also impacts the results of factor analyses because these techniques (i.e., Structural Equation Modeling: SEM) are based on correlations and covariances. When IER was present in 10% of a sample, unidimensional scales fit a two-dimensional model better than a unidimensional model (Schmitt & Stuits, 1985). In another study, when careless responding was present in at least 10% of a sample, researchers are more likely to reject a unidimensional model (Woods, 2006). The severity of this effect increased in scales using more reverse-worded items. Another study found eigenvalues and scree plots showed that two factors should be extracted from theoretically unidimensional scales (Huang et al., 2012). In that same study, removing cases with IER improved the unidimensionality of the scales.

Regression weights and relationships with other variables are also affected by IER. Because IER response sets can be outliers, these cases can have a strong effect on regression coefficients. Stevens (1984) argued that just a few outliers can have a strong influence on regression coefficients. In another study, Hough et al. (1990) demonstrated that random responding attenuated relationships between personality and job performance. Given this finding, IER could lead to Type II errors in practical areas where evidence of criterion-related validity is necessary, such as personnel selection.

Forms of IER

In general, IER manifests itself in two broad patterns: Patterned response sets and random response sets. In the patterned response sets, the responses may be consecutive (e.x., 1,1,1,1, etc.) or more complex (e.x., 1,2,3,1,2,3,1,2,3, etc.). The key to determining a patterned response set is to know what constitutes a case of IER and what is realistic given the situation. For example, if someone is high in conscientiousness, their endorsement of the "Strongly Agree" response option for every item (assuming no reverse coded items) may be accurate patterned responding.

Random response sets are more complex and it is unclear in the literature what randomness looks like in a response set. In the literature, the underlying distribution from which researchers draw random responses is either unspecified, or is comprehensive in that researchers use multiple distributions. For example, Meade and Craig (2012) simulated random responding from both normal and uniform distributions. The reason is due to not understanding how people randomly respond.

Psychometric Synonyms

Meade and Craig (2012) first developed the Psychometric Synonyms index, which is a within-person correlation as a measure of personal consistency. The calculation involves first finding pairs of items that are strongly and positively correlated. Then, for every person, a correlation is calculated using scores on those pairs of items. A strong correlation (indicating consistency) is a good score and weak and negative correlations (indicating inconsistency) are suspect IER cases.

This index is relatively new as compared to some of the other methods such as even-odd consistency (or personal reliability) or its more popular counterpart, psychometric antonyms (Curran, 2016). Although the only difference between the psychometric synonyms and antonyms is that the antonyms use strong negative correlations to choose items into pairs, they are only moderately correlated (Meade & Craig, 2012).

The psychometric synonyms index has many advantages over other methods of detecting IER (see Meade & Craig, 2012, Huang et al., 2012, Emons, 2008, and Curran, 2016 for a thorough discussion of the methods). There are two major types of detection methods, each with advantages and disadvantages. The first type is called the *a priori* methods, which involve making a scale for the sole purpose of detecting IER. The advantage to these scales is that they are construct valid, with relatively clear interpretations, and with somewhat clear recommendations for their use. However, a disadvantage is that they increase survey length, which can cause the IER that the detection method is meant to detect.

The next set of techniques is called *post hoc* methods, which are statistical calculations and include the psychometric synonyms. As opposed to the *a priori* methods, an advantage to these techniques is not increasing survey length. However, a disadvantage is that there is weaker construct validity compared to *a priori* methods. Although these methods tend to be correlated with each other and other IER indices, the interpretation of the indices is generally less clear cut. For example, one technique is the outlier analysis Mahalanobis D. Although in some conditions it is effective at detecting IER (e.g., Meade & Craig, 2012; Barnes & LaHuis, 2017), the resulting index is still a measure of the case's distance from a centroid. The reason for the distance does not have to be IER.

The psychological synonyms index has most of the disadvantages associated *post hoc*, but it has many advantages as well. First, this technique, like other *post hoc* techniques, does not inherently increase survey length. It is also relatively easy to calculate. There have been a few studies that have examined the effectiveness of the psychometric synonyms and found that the psychometric synonyms index is good at categorizing people into latent classes defined by types of respondents (careful, random, and consecutive responders; Meade & Craig, 2012). Although it is not as powerful as other indices in simulated data (Meade & Craig, 2012; Barnes & LaHuis, 2017), it is robust to different types of random responding (normal random and uniform random responding; Meade & Craig, 2012), does not require as strong of prerequisites to run as the similar index of even-odd consistency (many different unidimensional subscales), and is not scale dependent like Mahalanobis D. In addition, it removes the bias and subjectivity of the researcher from which items are included in the index (Desimone, Harms, & Desimone, 2015).

Purpose

The purpose of the current study is to empirically assess several of the existing recommendations for the use of psychometric synonyms. At this time, it is unclear why psychometric synonyms perform poorly compared to other indices of IER. Additionally, less is known about it relative to other indices. There are a few recommendations for its use but these are largely an application of the recommendations for the psychometric antonyms index with which it has a moderate correlation only (Meade & Craig, 2012). Therefore, these other recommendations, although reasonable, appear to be arbitrary. Improving our understanding of psychometric synonyms could lead to answering questions about power and error rates, the practicality of this index, and could allow future researchers to more realistically and accurately compare psychometric synonyms to other indices. Six research questions are proposed in the current study based on recommendations (or lack thereof) for cutoff scores for the index, required correlation for selecting pairs, number of pairs to include in the index, between pair dependence, and item response skewness. These recommendations are now presented in greater detail.

The first recommendation involves the cut-off score for deciding if a case is IER or not. There are some general suggestions, such as identifying cases that are either only weakly positively correlated or negatively correlated. However, there are no empirically supported, explicit and specific cut-off points. Additionally, a single all-encompassing cutoff point to use in all situations may be impractical because the of inherent variability within situations. This leads to my first research question:

RQ1: What effect does the cut-off have on the power and error rates of the psychometric synonyms index?

The next recommendation is the within-pair correlation strength to use for inclusion into the index. The current recommendation is to use pairs of items that have correlations larger than r = 0.60 (Curran, 2016; Meade & Craig, 2012). However, there is little to no empirical basis for this value (Curran, 2016). As previously stated, Meade and Craig (2012) found that the Psychometric Synonyms index performed well when classifying empirical data into latent classes, but it was less useful than other indices (even within the personal consistency typology of indices) given their power and error rates in simulated data. One reason for this result might be the cut-off point for the strength of the between pair correlation of items.

A correlation of .60 indicates a strong relationship, and having correlated items is a necessary requirement of the psychometric synonyms index because strong correlations between items implies consistency between responders. The debatable aspect of the recommendation is whether .60 is strong enough for an accurate consistency calculation. A correlation of 0.60 equates to only 36% of shared variance between the two items. Although this works for empirically establishing relationships in research, it also means that most of the variance is unique. Therefore, some inconsistency due to random error would be expected but would not be corrected for in the calculation.

Correlations of .60 are uncommon in organizational research. For this reason, achieving this recommendation might be challenging (see Maniaci and Rogge, 2014). Although a correlation of .60 might be necessary, it may also be impractical. Therefore, this leads to the second research question:

RQ2: What effect does the within-pair correlation strength have on the power and error rates of the psychometric synonyms index.

The next recommendation is the number of pairs of items to include in the index. There are no explicitly stated recommendations about the number of pairs to include in the psychometric synonyms index. However, for psychometric antonyms, the recommendation is at least 30 pairs of items (Johnson, 2005). This makes sense because a correlation based on few pairs can be inaccurate and unstable, which leads to difficulty with interpretation. When combining this recommendation with the first one, it, makes calculating the correlation difficult because not only are strong correlations difficult to find in organizational research, but the index requires thirty of them. Past research on psychometric synonyms used either far fewer than 30 pairs (e.g., 5 pairs in Maniaci & Rogge, 2014 and 27 in Meade & Craig, 2012), or reduced the recommended correlation to achieve a reasonable number of pairs (Barnes & LaHuis, 2017). Because both this and the first recommendations are frequently interrelated, the key is to find a balance between them.

As previously mentioned, the first two recommendations are interrelated. Selecting the pairs of items based on an extremely strong correlation could result in having an insufficient number of item pairs. Using a weaker correlation as the inclusion criterion might increase the number of pairs but at the risk of including pairs of items that might receive different responses, which could also impact the index. Therefore, this study will help determine the impact that the number of pairs has on the utility of the index.

RQ3: What effect does the number of pairs of items have on the power and error rates of the psychometric synonyms index?

One factor not yet examined in the literature is the relationship between the item pairs. Although there is the recommendation that the same item should not be used in multiple pairs (Curran, 2016), it would not be surprising for researchers to include many item pairs that come from the same scale in the index calculation because most scales include items that are strongly correlated with each other. Thus, there could be strong correlations not only within the pairs (as there should be), but also strong correlations across pairs. This could lead to low variability in the number of response options selected within individuals which can attenuate correlations (Goodwin & Leech, 2006). The attenuation can produce a Type 1 error (found inconsistency when it is not present). If the variability is low enough (as in only two different response options), the Pearson product-moment correlation becomes a *phi* - coefficient. Although it is possible for a *phi* - coefficient to range from 1 to -1 as in a Pearson correlation, it is also likely (and arguably more so) that the coefficient could have a maximum less than |1| (Ferguson, 1941). It has shown also to be a poor indicator of association (Alexander, Alliger, Carson, & Bennett, 1985) which the main assumption of the psychometric synonyms is that responses are associated.

RQ4: What effect does the dependence across item pairs have on the power and error rates of the psychometric synonyms index?

Another factor that could impact the efficacy of the index is the severity of IER within a single case. The impact of case severity on the index is intuitive. Less severe cases of IER are more difficult to detect than severe cases (Barnes & LaHuis, 2017; Meade & Craig, 2012). In terms of the literature, there has been some work on the base rates of levels of case severity. For example, Johnson (2005) found a base rate of 3.5% which included only cases that gave the same response for each item on the survey. This constitutes the most severe case possible (100% of items responded to with IER). However, some studies found much higher rates of IER (e.g., Baer, Ballenger, Berry & Wetter, 1997; Berry et al., 1992). Although this estimation includes all levels of severity as assessed by a self-report item, this result can be taken as preliminary work on how many people engage in less severe instances of IER. However, it is unknown how well the index performs at detecting IER at various levels given other circumstances.

RQ5: What effect does the level of within case IER severity have on the power rates of the psychometric synonyms index?

The skewness of the data may also affect the index. Researchers tend to use measures that contain items with normally distributed response frequencies, which can indicate an item with desirable psychometric properties. However, in an applied setting, this may not be the case (Micceri, 1989) either due to a lack of executive and/or financial support to engage in the best practices of measure development. This, along with a desire for a homogeneous workforce in terms of having only good workers who have a certain profile of traits and skills, and who work in a similar environment, can lead to skewed data. The magnitude of Pearson's *r* is attenuated when variables are skewed (Calkins, 1974; Dunlap Burke & Greer, 1995). This can lead to a Type I error. It is unclear how much of an impact skewness can have on the index.

RQ6: What effect does skewness of item responses have on the power and error rates of the psychometric synonyms index?

Finally, another factor that may affect the Psychometric Synonyms' performance (and any IER index in general) is the type of IER. Due to the calculation of the correlation, the same consecutive response in all responses (longstring) will not yield an index. Therefore, the index cannot detect severe longstring without modification. It is also not necessary that it does. The longstring index is an index that nearly indistinguishable from the behavior associated with it. It is, therefore, arguably the best way to detect such behaviors

(Meade & Craig, 2012). Therefore, no more attention will be paid to this type of IER in this study. For a more thorough review, I recommend Meade and Craig (2012) and Huang et al. (2012).

The other broad category of IER is random responding. Traditionally, there are two broad types of random responding within the IER literature: normally distributed and uniformly distributed. Although we have evidence to support that IER responses tend to be dispersed around the midpoint of a Likert scale (Huang, Liu, & Bowling, 2014), some isolated cases of uniformly distributed random responding may exist. There is little reason to expect any major differences between the psychometric synonym index's ability to detect IER between the two types of random responding. Meade and Craig (2012) found an effect size (eta-squared) of 0 in the effects of the type of random responding simulated, including the interaction conditions with the different types of random responding in them. Therefore, in lieu of a research question, I plan to only replicate the findings of Meade and Craig (2012) regarding the type of random responding to be as comprehensive as possible.

Method

Data Generation

The data was generated in R using a combination of the *psych* (Revelle, 2012) and *mnormt* (Genz & Azzalini, 20016) packages. The items all mimicked graphic rating scales from 1 to 5. The number of items corresponded to the number of pairs (8, 16, 24, and 32) multiplied by two. These were chosen to be somewhat inclusive of examples given in the literature and to ensure whole numbers for introducing IER described later.

In addition to varying the number of pairs, I varied the distributions of the non-IER data in two ways. In one level of the manipulation, the response frequencies for each category were centered around the midpoint of the scale with a mean of approximately 3 and a SD of 1. I will refer to this as “normally distributed data”. In the second level, the response frequencies were larger at the upper end of the scale (4 and 5 for example) than at the lower end of the scale. The result were items that had an approximate mean of 3.7 and an approximate SD of 1. I will refer to this as “skewed data”. To implement these conditions, I generated data from a multivariate standard normal distribution using a correlation matrix based on other conditions. The development of this correlation matrix is described in subsequent sections. Then, I used a specified marginal distribution to convert the continuous variables into a scale that mimicked the graphic rating scale from 1 to 5. The marginal distributions were different for normal and skewed conditions.

Each sample consisted of 10,000 cases with a constant of 10% (1,000) of those cases consisting of IER. This prevalence of IER seems to be the modal rate from the literature (Curran, 2016). Although the sample size is larger than is typical for a published study, the sample size is more congruent with the trend towards big data made possible by technological advances in survey software and statistical analysis programs.

The correlations between items with pairs were varied by r = .2, .4, .5, .6, and .7. This range assessed the recommended cut-off for inclusion into the index (0.6) as well as some stronger and some weaker correlations. I varied the correlation between item pairs by a percentage of the correlation between items within pairs (75%, 50%, 25%, and 0%). For example, if the correlation between item pairs was .6, the possible correlations between all the other items (not including the items that are part of a pair) were close to r = .45, .3, .15, and 0 respectively.

To introduce IER, I generated first the data directly from a model which included the correlation matrix and marginal distributions which lead to the normally distributed and skewed data conditions, and then entered IER into 10% of those cases on the basis the severity of IER (25%, 50%, 75%, 100%). Every level of severity of IER was present in every sample and was divided equally. In this study, 250 cases were assigned to each level of IER severity. For each case, the items that were introduced with IER were randomly chosen. I will describe this more in the next section.

The type of random responding varied by (a) random responding following a normal distribution and (b) random responding following a uniform distribution. With the introduction of IER, the sample correlations tended to decrease. To make the comparisons more like the real-world, the correlations between and within the pairs within the generating model were increased to ensure that the correct magnitude of correlations were used in the calculation. To ensure that the correlations did not increase too much, I employed a check on the samples where the largest possible correlation between item pairs could not exceed the cutoff correlation by more than .1 and the minimum correlation could not be smaller than the cut-off (e.g., if the item pairs are supposed to be correlated at .4, the correlations must fall between a range of .4 and .5). For the correlations between pairs, the range of possible correlations were no less than -.05 of the condition (e.x., if the non-pair correlations were supposed to be .3, then no correlations smaller than .25 were used) and they were smaller than the cutoff correlation for inclusion into the index calculation. In general, tests of the program yielded correlations that are relatively close to the condition due to the large sample size. These bands of correlations were used to make data generation possible. For each condition, I replicated the data 250 times.

I did not vary the prevalence of IER across the entire data set (i.e., the number of cases with IER) nor the sample size. I do not deny that correlations between items is impacted by IER prevalence or by sample size. Due to IER, correlations can be attenuated, and in some instances, the correlations can be inflated. The first can lead to fewer pairs selected for inclusion into the calculation of the index and/or using weaker correlations to select pairs to achieve an acceptable number of pairs. The latter can lead to Type I errors by including items that are not truly strongly correlated enough to yield an effective index. For sample size, the correlations coefficients tend to less stable for smaller samples, and smaller samples can have the issue of lacking representativeness of the population. Therefore, obtained correlation coefficients could lead to choosing items that may only be spuriously related. This allows for the possibility of accurately responding with different responses, but that response set could still reflect reality.

Despite these issues, I did not manipulate either factor due to the control I had in my study. These factors would have an impact on item selection for inclusion into the pairs (an indirect effect). However, in this study, the "items" for selection into the index were predetermined and checked to make sure that they fell within the parameters of the study. If the check failed, then the program resampled. Sample size did not matter within this study as well. The same response set always yields identical coefficients no matter the sample size or what those numbers substantively represent. Once again, sample size only has an indirect effect on the psychometric synonyms that was controlled for by this study.

Data Analysis

Psychometric synonyms. To calculate the psychometric synonyms, I made a correlation matrix to obtain the pairs of items that were to be included in the pairs. Then, I used the items that were specified to be pairs and calculated a correlation between them for every person. I calculated the psychometric synonyms index before and after introducing IER. Having the mean index before and after introducing IER served as a check to ensure that the manipulations worked properly and provided supplemental information for many of my posited research questions.

Because I randomly selected the items that had IER within each case, this could have resulted in confounding the index with the number of IER items and the number of pairs of items that had IER. For, example in one case, I could have an index calculated from two items in which only one pair was affected. In another, I could have an index calculated from two items, but the case had two pairs affected with IER. Although I could have controlled for this by explicitly selecting the pairs and items that contained IER, this could reduce the generalizability of the study. In empirical data, there is no way to know which instance is the case. To help make the results more generalizable, I decided to replicate the results many times to ensure that the distribution of power and error rates included as many combinations of this confound as possible. This should mitigate the effects of this confound when comparing across conditions.

Empirical cut-offs. To establish cut-offs for flagging the case as an IER case, I used four cut-offs: an index of .1, .2, .3 and .4. For each cut-off, each condition, and each replication, I assessed the power and error rates. This resulted in a distribution of 250 power and error rates for each cut-off and each condition. I reported the mean and standard deviation of those distributions. The recommended cut-offs for conditions were those with the largest power and smallest error rates.

Power and error. I calculated power for each empirical cut-off, every level of severity of IER and an overall estimate which encompassed every level of severity combined. For each empirical cut-off, I made a dichotomous variable consisting of flagged vs not flagged. Flagged cases were those that fall below the cut-off. To calculate the power, I summed the number of cases flagged correctly and divided them by the total number of cases in the aforementioned conditions. For example, if 150 cases were flagged in the .1 cut-off for 75% severity, I will have a power rate of 150/250=0.6. To calculate error, I counted the number of cases flagged in the non-IER cases and divided that number by the total number of non-IER cases (9,000). I did this for each replication and then calculated an average and standard deviation of the power and error rate distributions.

Results

RQ1: What effect did the cut-off have on the power and error rates of the psychometric synonyms index?

The overall results (collapsed across every other condition) leads to a clear conclusion. Larger cut-offs for the decision of IER vs. non-IER resulted in more power and more error. In Table 1, one can see a monotonic, and possibly linear, increase in power and error rates as the cut-off increased. When calculating the psychometric synonyms index, the result is a distribution of index scores somewhat centered around the within-pair correlation. Therefore, larger cut-offs include a larger proportion of possible index scores as IER. This makes IER easier to detect simply by flagging more cases, but also increases the probability of making an error for the same reason. There was not a single exception to this barring times when the error was zero across multiple conditions (e.g., Table 18 and 19). Please note that this logic will be prevalent throughout the rest of this section.

RQ2: What effect did the within-pair correlation strength have on the power and error rates of the psychometric synonyms index.

From Table 1, the trend was that stronger within-pair correlations resulted in lower power rates and lower error rates. The reason for the lower error is due to the distribution of non-IER psychometric synonyms index. Because this distribution is centered around the within-pair correlation, the stronger within-pair correlations shift the location of the non-IER indices further away from the cut-off. The decrease in power follows a similar logic, especially in the less severe cases of IER. In those cases, there are items that are non-IER. This will increase the psychometric synonym index (i.e., look more consistent). After the introduction of IER, the indices become attenuated. However, in the less severe cases, the attenuation might not be enough to push it into the IER category as defined by the cut-off.

In terms of within-pair correlations, a correlation of .2 conditions yielded the best power estimates. However, they also had dismal error rates (the smallest error rate, 0.18, was on Table 2 within the 32 pairs conditions). Given that the purpose of this study is to provide recommendations, and because I cannot recommend using a within-pair correlation of .2 within the context of this study, I will only discuss the within-pair correlation of 0.2 conditions to explain a trend for other conditions.

As stated above, the general rule of thumb is higher correlation leads to less power and less error. Given the data, the effect on error and the total power rate (collapsing all levels of IER severity) was consistent. However, this rule seems to interact with the severity of IER and dependence. There was a general decrease in the detection rates as the strength of the within-pair correlations increased for 25% IER cases. This is evident from Tables 2 – 33. Another consistent pattern was the detection rates in the 100% IER conditions did not seem to change as a function of within-pair correlation strength. This could be because those cases might have yielded indices that were less than even the smallest cut-off (.1). Considering the trend, it is likely that a smaller cut-off (such as 0 or lower) would show changes.

One pattern that changes between tables is the change in the detection rates of 50% and 75% IER. These seemed to be affected by dependence and the cut-off because the former shifts the index distribution mean index closer to 0 and the latter shifts the threshold for classifying cases into IER closer to 1. In Table 5, one can clearly see that the 50% IER detection rates decrease as the within-pair correlations get stronger. However, an examination of Table 17 will show that the decrease was considerably smaller. A similar pattern can be seen for 75%. On Table 5, as the strength of the within-pair correlation increased, the 75% IER conditions have a small decline in detection rates in pairs that are fewer than 32. However, in Table 17, the changing was mitigated and in some cases, is non-existent.

RQ3: What effect did the number of pairs of items have on the power and error rates of the psychometric synonyms index?

From Table 1, the trend was that more pairs lead to fewer errors and more overall power. The effect seemed to level off at around 24 pairs, especially for error rates which did not change much (before rounding, there was a slight difference with errors being .004 smaller for the 32 pairs). The effect on error makes sense due to the stability of a correlation. More data means that the correlation coefficient is more stable, and therefore, is less affected by less severe IER behaviors or odd anomalies that may appear to be IER. For power, the results were a little more complex. The power increases tend to be in the more severe cases of IER. However, for the reasons stated above, the less severe cases became harder to detect.

Although the general rule holds true often, there are numerous exceptions for power. The rule always holds true for error.

The exceptions exist on Tables 2,6,18 and 22 in the within-pair correlations of 0.4 and larger in the total power rows. In these instances, there was little evidence to support any effect. At best, there may have been a weak effect because power decreased, but that effect was inconsistent and likely due to chance. Note that the rule about less severe cases being harder to detect and the more severe cases being easier to detect held true. The concern is that the gains in detection rates from the more severe cases of IER did not outweigh the loss in the less severe cases as is true in the other conditions.

These tables share the same cut-off (0.1) and weak dependence (.25 and 0). The most convincing explanation for these exceptions is that the number of pairs and the low level of dependence does not have a drastic impact on the post IER mean index. Because the distributions of indices are further away from the cut-off of .1, it is likely to not have much, if any, of an effect. However, one can see that the general rule held for the within-pair correlation strength of 0.2 conditions. In those conditions, the distribution of the post IER psychometric synonym index was closer to the cut-off than any other condition. Therefore, the rule applied.

RQ4: What effect did the dependence across item pairs have on the power and error rates of the psychometric synonyms index?

These conditions had a substantial impact on the accuracy of the psychometric synonym index. From Table 1, one can see that as dependence increased, both power and error increased. This is most likely due to the impact of dependence on the mean psychometric index. The general rule is that greater the degree of dependence between pairs, the lower the mean synonym index. At 0.25 dependence, the mean synonym index was still arguably close to Curran's (2016) claim that the mean index is close to the within-pair correlation criterion. However, at 0.75, the differences were drastic. For example, in Table 17, one can see that the pre/post mean psychometric indices were considerably smaller than the within-pair correlation (up to a difference of 0.23 in the scale of a correlation). Due to a similar logic to that described in the RQ1 section above, power and error increases. The error increased because the non-IER index distribution shifted to closer to the cut-off. The power increased because the distribution of indices shifted further in the direction of the section of the continuum that is IER as defined by the cut-off.

The general rule of thumb is that more dependence increases power and error for reasons previously explained. The major exception to this was the 100% IER severity cases (and in some situations 75%) where the power rates seemed to be relatively stable across levels of dependence. For example, examine the 100% IER power estimates on Tables 18, 22, 26, and 30. At the most, the estimates differ by 0.01 which is small and most likely due to chance because there were not any discernable patterns.

The error rates also increased. It seems like a little dependence is acceptable and can lead to better power estimates. This is good news for psychologists because most things are correlated at least to some degree. Dependence of .25 did not have a huge effect on the error rates. That said, higher levels of dependence can have a drastic effect. For example, with dependence of .75, smaller cut-offs with strong within-pair correlations and with many pairs of items must be used to have proper control of Type I errors (Tables 14-17 and 30-33). Although the estimates of error were within acceptable bounds in the previously mentioned situations, some situations might call for even stricter control of Type I error. In those situations, one would sacrifice some power to detect IER.

RQ5: What effect did the level of within case IER severity have on the power rates of the psychometric synonyms index?

As found in previous literature (e.g., Barnes & LaHuis, 2017) and in Table 1, more severe cases were easier to detect than less severe cases. There seems to be a non-linear trend. The differences between 25% and 50% and 50% and 75% IER cases tend to be larger than the difference between 75% and 100%. This could be evidence of an approximate level at which the psychometric synonyms perform best at detecting IER.

The general rule is that more severe cases of IER are easier to detect than less severe cases. There was not a single situation in which a less severe IER condition had larger power estimates than a similar, more severe, condition. That said, the trend for this result is an asymptotic function. In addition, when the cut-offs were smaller, there tended to be a larger spread across the levels of severity in power. The same was true of dependence and the strength of the within-pair correlation. More dependence and a stronger within-pair correlation lead to less variability in power estimates across level of IER severity.

These results are not surprising. The non-linearity most likely comes from the relatively weak/non-existent effect of within-pair correlation strength and dependence on the 75% and 100% severity levels. As previously mentioned, these cases are less contaminated by the within-pair correlation strength and therefore, their distribution should be located closer to the section of the continuum indicating less consistency (IER). For the less severe cases, they are more contaminated with the within-pair correlation. Therefore, their index distribution would be located closer to the within-pair correlation, which indicates consistency. Together, this makes the less severe cases have considerably less power as the within-pair correlation strength increases and only small, if any, changes in the more severe cases as the correlation increases. This makes the spread of power estimates larger across levels of severity. There is a similar argument for dependence because the severe cases were less affected by dependence and should have fallen closer to the inconsistency side of the continuum regardless. The more severe cases would have remained relatively unaffected.

RQ6: What effect does skewness of item responses have on the power and error rates of the psychometric synonyms index?

From Table 1, there appears that there was only a small difference overall for both power and error. Power estimates were in favor of the skewed data and the error estimates were in favor of the normally distributed data. However, this main effect seems to be somewhat misleading due to some interactions.

Most differences were very small (0.01 – 0.02) in the overall estimates such as the total power and error estimates. However, examining the power rates by severity level tells a slightly different story. Although most differences were relatively small, there were some differences that reached up to 0.08 (Tables 5 and 21, 32 pairs with a within-pair correlation strength of 0.7 in the 25% IER conditions).

To explain these results, I ran a few supplemental analyses. I generated data in the same way as in the methods section, but only looked at within-pair correlations for within-pair correlation strength of 0.7, 32 pairs, normally distributed random responding for both skewed and normal conditions with 0 dependence (same conditions as found in Tables 5 and 21). As a comparison, I also examined the same conditions, but with .75 dependence (Tables

17 and 33). In the high dependence condition, there was only 1 small difference between normally distributed and skewed data in power rates.

Table 34 shows the mean and SD Psychometric synonym index for each level of severity in each of those conditions. In general, the conditions of high dependence yielded similar mean and SD psychometric indices except for the 25% and 0% IER conditions. In these conditions there were slight differences and by extension only slight differences in power and error. Because the 25% condition yielded means well below the cut-off of 0.4 (Regardless of the small effect of skew on the means), I would not expect to see notable differences between skewed and normal data. This seems to be the case. However, in the 0 dependence conditions, there was at least one notable difference between normal and skewed data in the 25% IER conditions. This condition also happens to be the largest difference in terms of power. Because the cut-off was .4 in these conditions and the 25% IER conditions were already close to the cut-off due to the introduction of IER, it appears that the small effect of the skewness on the index seemed to push the distribution in that condition closer to the cut-off as compared to the normally distributed data. This would result in higher power rates in the skewed data as compared to the normally distributed data. Given this explanation, one would expect also for there to be larger differences as the cut-off increased in the 0 dependence conditions, and power differences to decrease as the cut-off increases in the high dependence conditions due to the effect of skewness and dependence had on the mean psychometric synonym index. A view of Tables 2-5 and 14-17 in comparison to their skewed analogs (Tables 18-21 and 30-33 respectively) shows this pattern to be true.

Type of Random Responding

These findings do not correspond to a research question, but were an attempt to replicate the previous findings by Meade and Craig (2012). In short, I did not replicate their findings. From Table 1, one can see that there were slight differences in the overall power estimates in favor of the uniform random responding. However, this effect seems to interact with within-case IER severity.

Although, I did not replicate previous findings exactly, there was stability of power rates in the 100% IER conditions. The largest differences between the two types of random responding seem to be in the less severe cases. This is probably due to the nature of the two types of distributions from which the random data were generated.

The previous logic of lower mean index leads to more power and more error does not seem to fit in this situation. Because the non-IER cases were the same in both normal and uniform random responding conditions, the error rates and the pre IER mean indices were identical. The post IER mean indices were generally the same or only differed by 0.01 with the normally distributed random responding having the larger post IER index means. One could argue that in the instances where the post index mean did differ, this difference in post - IER indices could explain why the uniform random responding was easier to detect. However, the instances where the means were about the same (e.g., Table 2 where there were 16 pairs correlated at 0.7), there are still notable differences. This explanation does not seem to be supported in this case.

One possible explanation for this finding could be due to the nature of normal and uniform distributions. In the normally distributed data, extreme values (in this study) 1 and 5 are unlikely values. In a uniform distribution, the probabilities of each response are equal. This could lead to larger deviations from the consistent (non-IER) responses within some of those cases. For example, consider a response set that consists of 3s,4s which is relatively consistent. Then, write over 25% of those cases with symmetric, normally-distributed, random responses around the mid-point of the scale (like in this study). The most likely values would be 2s,3s, and 4s. This would introduce some inconsistency, but not to a severe degree. Write over some of those values with values drawn from a uniform distribution. Values that are considerably more inconsistent (such as 1s) would be more likely than in the normal random responses and appear to be more inconsistent. Given that more severe cases are easier to detect, it makes sense that those cases would be easier to detect.

Recommendations

Up until this point, most of the findings are either general or vague. Although it is important to notice that, for example, dependence of item pairs tends to drive down the mean psychometric synonym index, that information does not give researchers and practitioners what they need to use these indices in their work. This section provides more explicit and specific recommendations on the basis of the answers to the previous research questions.

Tables 35 and 36 represent summaries of these results. The recommendations stated on those tables come from the largest cut-off score that controls for Type I error (i.e., error rates were less than .05). Because the larger cut-offs yielded larger overall power estimates and also have the largest error rates that fall with acceptable error estimate parameters, these cut-offs should be treated as maximums. It should be noted that there are only minor differences between the normally distributed (Table 35) and negatively skewed data (Table 36).

For the within-pair correlation of 0.4 conditions, there were not any conditions in which both the power and error rates together were acceptable. However, in some situations, one may adopt the view that “something is better than nothing”. In those situations, most would probably agree that making a Type I error is the main concern (assuming the procedure has some ability to detect cases). In those instances, the within-pair correlation of .4 had acceptable error rates with at least 24 pairs, with a dependence of 0, and with a cut-off of .1 (Table 35). One could use a cut-off of .2 if the index includes 32 pairs with a dependence of 0 (Table 4). If the data are skewed, one could use a cut-off of .1 with a dependence of 0 and 24 or more pairs. If there are 32 pairs, one could use a cut-off of .1 assuming only slight dependence (0.25; Table 36).

For the within-pair correlation of 0.5 conditions, a user gets a little more flexibility. Within this study, only conditions with at least 16 pairs had acceptable error estimates if dependence did not exceed .5. These conditions did not yield an acceptable total power estimate. However, using a cut-off of .3, with zero dependence, and having at least 24 pairs yields estimates that are close (.75 and greater- Table 4). In addition, if the goal were to be able to only detect severe cases (i.e., 75% to 100% of IER with a case), the power rates exceeded the acceptable threshold and occasionally approached perfection in the aforementioned conditions. There were no differences between normally distributed and negatively skewed data for within-pair correlations of 0.5 between Tables 35 and 36.

For the within-pair correlation of 0.6 conditions, there is the possibility of only needing 8 pairs. Assuming dependence is .25, one could use a cut-off of .1 if the data are normally distributed. If dependence is zero, one could use .2. None of these conditions had acceptable power rates however. In the 16 pairs conditions, and assuming zero dependence, one could use any of the cut-offs with acceptable control of Type I errors, but I recommend .4 (Table 5) because the overall power estimate is the largest and actually close to acceptable.

If the dependence is large (.75) then there was not a cut-off that yielded acceptable error rates within this study. If one has at least 24 pairs, there was a cut-off found within this study for all levels of dependence except the highest. If the dependence 0, then a cut-off of .4 yielded acceptable power and error rates. In addition, if the dependence is .25, then a cut-off of .3 is close to reaching both the acceptable power and error rates combined. In general, using a within-pair correlation strength of .6 tends to have the least restrictive scenario for having acceptable power and error rates combined. This lends some credence to the previous recommendations where .6 or larger is the within-pair correlation inclusion criterion. It also provides some credence to the 30 pairs recommendation. Although having 24 pairs is fewer than having 30 pairs, the notion that many pairs should be used holds true. If one has 32 pairs, then dependence becomes less of a concern because many of the levels tested yielded cut-offs with acceptable total power and error rates.

In the within-pair correlation strength of .6 conditions, the negatively skewed data had more situations that had acceptable error and power rates. That said, the differences in the one extra condition (16 pairs, dependence of 0) were negligible (i.e., the total power estimate was 0.01 away from the acceptable threshold). The skewed data required a smaller cut-off in the 16 pairs condition due to the increase in error rates associated with skewness.

The best-case scenarios involve having within-pair correlations of 0.7. Most conditions, apart from only having 8 pairs, had a cut-off with acceptable error rates. If they did not, the estimates were generally close to the acceptable thresholds except for the 16 pairs and high dependence condition. In addition, within-pair correlations of 0.7 had the most situations that had acceptable power and error rates together. One could use as few as 16 pairs and a cut-off of .4 assuming that dependence is .5 in normally distributed data. The dependence would need to be .25 in skewed data. The cut-offs in the skewed data need to be smaller overall to control for type I errors.

Discussion

The purpose of this study was to propose recommendations for using the psychometric synonyms index using an empirical basis. Many of the previous recommendations come from a related, but not redundant index. Therefore, those recommendations, while making logical sense, were not based on any empirical backing. To provide these recommendations, I first answered some questions about how the psychometric synonyms function under certain circumstances. Then I, posited explicit cut-offs that can be used in such circumstances accompanied by how to expect them function in said circumstances.

In sum, the previous recommendations were not unreasonable. The recommendation of 0.6 for inclusion into the index (e.g., Curran, 2016; Meade & Craig, 2012) is reasonable and may be a good balance of practicality and control of Type I error rates with acceptable power. That said, using 0.7 would most likely lead to better control of error, but less power in detecting less severe cases of IER. If reaching the acceptable power threshold of 0.80 is not the primary concern, then 0.5 could be used, which is a more practical choice than either of the two mentioned above. The implied recommendation of having many pairs is also reasonable. More pairs tend to have better control of Type I error and allows for more flexibility in the choice of cut-off. The dependence and skewness attempted to see how relatively common situations, which can be known by a user, can impact the performance of the psychometric synonyms index. To sum up those results, skewness and stronger between pair correlations (dependence), leads to more power and more error. The last few conditions were attempting to find what forms of IER the psychometric synonyms could detect. Thankfully, the psychometric synonyms is relatively robust to the model of random responding, at least within normally distributed and uniformly distributed random responding models. The psychometric synonyms index also seems to work well at detecting severe cases of IER.

For the cut-off, the results are not clear-cut enough to recommend an all-encompassing cut-off. The cut-off should be a product of the dependence, inclusion criteria, and the number of pairs. That said, if the goal is power, then one should consider a larger cut-off. However, if control of Type I error is the goal, then using a smaller cut-off would be more appropriate. One may want to examine the distribution of the psychometric index to help determine how much of an impact various situations have on the index itself.

Limitations/Future Research

Although this study attempted to be as comprehensive as possible, there are many other factors to consider. One such factor is the correlations between items. Although I selected a range of possible within-pair correlations and included some correlations that may reflect common relationships between those items and other items included in other pairs, it is difficult to be all encompassing. Often correlation matrices are much more variable where some pairs are correlated higher than 0.7 and some are correlated 0.6 or 0.5. In addition, the dependence between pairs can vary from highly dependent to completely independent. One could assume in the case of variable dependence that the estimates of power and error for zero dependence from this study would provide the lower bounds for power and error. The estimates for power and error in the .75 dependence could provide the upper bounds. However, knowing the in-between that would match the situation could be difficult. The same is true for the strength of the within-pair correlation strength. Future research should consider this for more variable situations. One possible area would be to develop a program that can find the estimates of power and error given the parameters of a data set and find cut-offs via a grid search.

Another limitation of this study is that it fails to consider the order in which items are put into the pairs. For example, assume that Item 1 and Item 2 are included as a pair into the psychological synonym index. In the data, should Item 1 be in column 1 and Item 2 in column 2 or reversed? As a simple demonstration of this problem, I refer you to the R script in Appendix A. This is a script that will first create a matrix of every possible combination of item pairs for 15 pairs of items (30 items). This totals in 32,768 combinations in which a maximum of 16,384 will give different results. Then it generates correlated data in which the correlation is approximately .221. This is the psychometric synonym index for this response set assuming that the index is calculated like it is normally calculated - pairs are put in order by the order of items. The next part calculates the psychometric synonym of this case for all possible combinations of the order in which items can be in the index. The last few lines calculates some descriptives and creates a histogram of the distribution of indices. The values range from .218 (which is not all that concerning) to .705 which should be concerning. Depending on the combination, the resulting index is either weakly consistent (possibly IER depending on the cut-off) to strongly consistent. This can introduce errors into deciding if a case is IER or not. It should be noted that this is a concern for the more popular psychometric antonyms index as well because the principle is identical.

Another limitation of this study is that is does not consider other types of aberrant responding including other forms of IER. I have already discussed one form of IER, longstring. To reiterate, the psychometric synonyms theoretically should not be able to detect this form of IER directly because those responses are perfectly consistent assuming that items have equal thresholds for response options as is assumed in Classical Test Theory. In addition, there is no need because one can detect this form of IER with a measure that is nearly indistinguishable from the behavior itself.

Another form of IER that could take place is semi-random responding. This behavior occurs when a respondent responds randomly in a pattern that would appear to be somewhat consistent. As an illustrative example, imagine a survey in which the results could impact various aspects of work life depending on the results. Imagine also that the survey taker does not have the time to take the survey, but is being forced to do so by some external pressure (supervisors, peers, etc.). In those instances, the survey taker might opt for giving all favorable responses, but do so by randomly responding to a survey with all 4s and 5s assuming a five-point Likert-type scale where higher scores are considered favorable. It is unlikely that the psychometric synonyms would be able to detect these cases because they would appear to be consistent.

Another form of IER is missing cases. Although it is beyond the scope of this paper to delve into various models of missingness and how they can impact statistics such as a correlation, it is fair to assume that missingness can impact the psychometric synonym index. The most common approach to handling the missing data, pairwise deletion (which in this scenario would be equivalent to list-wise deletion), would lead to having fewer pairs in the index. Based on the results of this study, having fewer pairs can impact the error and power of the index negatively. Future research should examine to what degree missingness can affect the index as well as try to understand if missingness is evidence of IER. If the latter were the case, then finding the most accurate method of classifying the missing data as IER first might be a more useful avenue of research.

Conclusions

The psychometric synonym index is a relatively new, and until now, understudied IER index. It is a relatively simple index to calculate and has shown promise at being a useful tool in the detection of IER. The results of this study provide more clear and specific guidelines for how to use this index as well as how well the index may perform in many situations. With these specific guidelines, I hope that this study encourages its use and further investigation into how to use this index to detect cases of Insufficient Effort Responding.

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Table 1.

Main effects of each research question manipulation in order of discussion.

Manipulation	Condition	Power	Error
Cutoff	0.1	0.54	0.13
	0.2	0.68	0.19
	0.3	0.79	0.28
	0.4	0.88	0.38
Within-Pair Strength	0.2	0.78	0.58
	0.4	0.74	0.32
	0.5	0.72	0.20
	0.6	0.70	0.10
	0.7	0.67	0.03
Number of Pairs	8	0.65	0.28
	16	0.72	0.25
	24	0.75	0.23
	32	0.77	0.23
Dependence	0	0.68	0.15
	0.25	0.71	0.19
	0.5	0.73	0.26
	0.75	0.77	0.39
Within-Case IER Severity	25%	0.55	0.25
	50%	0.73	0.25
	75%	0.80	0.25
	100%	0.81	0.25
Distributions from which Data were Generated	Normal Distribution	0.72	0.24
	Skewed Distribution	0.73	0.25
Random responding	Normal Random	0.71	0.25
	Uniform Random	0.74	0.25

Note. All estimates are mean estimate after collapsing across all conditions. Severity does not have a different error rate for each condition because IER is present in every case within those conditions. The error rate is the overall mean error rate collapsing across every condition. Because the normal and uniform random responding conditions only differed in the IER cases, they also did not have a difference in error estimates from the overall error rate.

Table 2.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .1 and dependence of 0.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.54(.016)	.49(.017)	.47(.016)	.45(.014)	.43(.015)
	25%	.45(.032)	.32(.030)	.27(.027)	.22(.025)	.17(.025)
	50%	.53(.032)	.48(.031)	.45(.030)	.42(.030)	.40(.028)
	75%	.58(.032)	.57(.031)	.57(.033)	.55(.031)	.55(.029)
	100%	.59(.030)	.59(.029)	.59(.032)	.59(.031)	.59(.030)
	Error	.34(.005)	.13(.004)	.07(.003)	**.03(.002)**	**.01(.001)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.22(.003)	.42(.003)	.52(.003)	.63(.002)	.74(.002)
16	Total	.57(.015)	.50(.015)	.46(.014)	.44(.013)	.41(.014)
	25%	.44(.030)	.26(.028)	.18(.024)	.12(.021)	.08(.018)
	50%	.56(.030)	.47(.032)	.43(.032)	.39(.028)	.35(.030)
	75%	.62(.032)	.61(.030)	.60(.031)	.58(.029)	.58(.030)
	100%	.65(.030)	.65(.032)	.64(.030)	.64(.029)	.65(.029)
	Error	.28(.005)	.06(.002)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.54(.002)	.64(.001)	.75(.001)
24	Total	.58(.015)	.49(.014)	.46(.012)	.43(.014)	.41(.012)
	25%	.41(.029)	.20(.026)	.13(.022)	.07(.015)	.04(.012)
	50%	.56(.032)	.46(.033)	.41(.031)	.36(.032)	.31(.027)
	75%	.66(.027)	.63(.029)	.62(.028)	.60(.028)	.59(.032)
	100%	.68(.029)	.68(.030)	.68(.029)	.68(.031)	.68(.033)
	Error	.22(.004)	**.02(.001)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.75(.001)
32	Total	.59(.016)	.50(.014)	.46(.013)	.43(.014)	.40(.013)
	25%	.40(.031)	.17(.023)	.09(.019)	.05(.013)	.02(.009)
	50%	.58(.030)	.45(.032)	.39(.030)	.34(.030)	.28(.028)
	75%	.68(.030)	.65(.031)	.64(.030)	.62(.031)	.60(.034)
	100%	.71(.028)	.71(.028)	.71(.031)	.70(.028)	.71(.029)
	Error	.18(.004)	**.01(.001)**	**.00(.000)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.65(.001)	.76(.001)
		Random Uniform Responding				
8	Total	.55(.015)	.52(.016)	.50(.016)	.48(.016)	.46(.014)
	25%	.48(.032)	.37(.033)	.33(.030)	.28(.027)	.24(.027)
	50%	.55(.032)	.51(.030)	.49(.028)	.47(.032)	.46(.031)
	75%	.59(.032)	.58(.031)	.57(.032)	.57(.031)	.57(.031)

	100%	.59(.030)	.60(.032)	.59(.033)	.59(.031)	.59(.031)
	Error	.34(.005)	.13(.004)	.07(.003)	**.03(.002)**	**.01(.001)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.21(.003)	.42(.003)	.52(.003)	.62(.002)	.73(.002)
16	Total	.58(.016)	.52(.015)	.50(.015)	.48(.014)	.46(.013)
	25%	.48(.032)	.32(.030)	.26(.028)	.20(.026)	.15(.023)
	50%	.58(.031)	.52(.031)	.50(.031)	.47(.029)	.44(.030)
	75%	.63(.031)	.61(.032)	.61(.030)	.61(.030)	.61(.030)
	100%	.64(.032)	.63(.029)	.64(.031)	.64(.030)	.65(.029)
	Error	.28(.005)	.06(.002)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.53(.002)	.64(.001)	.75(.001)
24	Total	.60(.014)	.54(.014)	.51(.015)	.48(.015)	.46(.013)
	25%	.47(.030)	.28(.029)	.21(.024)	.14(.021)	.10(.019)
	50%	.60(.031)	.53(.034)	.50(.032)	.46(.030)	.42(.031)
	75%	.67(.028)	.65(.029)	.64(.033)	.64(.030)	.63(.030)
	100%	.68(.028)	.68(.028)	.68(.028)	.68(.029)	.67(.029)
	Error	.22(.004)	**.02(.001)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.74(.001)
32	Total	.62(.015)	.54(.014)	.51(.014)	.48(.015)	.46(.013)
	25%	.46(.029)	.25(.027)	.17(.021)	.11(.020)	.06(.016)
	50%	.62(.030)	.54(.034)	.50(.032)	.46(.031)	.42(.032)
	75%	.69(.030)	.67(.029)	.67(.029)	.66(.031)	.65(.029)
	100%	.70(.028)	.71(.027)	.71(.028)	.71(.031)	.71(.028)
	Error	.18(.004)	**.01(.001)**	**.00(.000)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.64(.001)	.75(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 3.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .2 and dependence of 0.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.63(.016)	.58(.016)	.55(.015)	.53(.015)	.51(.015)
	25%	.55(.033)	.41(.031)	.34(.028)	.28(.031)	.23(.028)
	50%	.62(.032)	.57(.032)	.54(.031)	.52(.031)	.49(.030)
	75%	.67(.032)	.66(.030)	.66(.030)	.65(.031)	.64(.028)
	100%	.68(.028)	.68(.029)	.68(.030)	.68(.028)	.68(.030)
	Error	.43(.005)	.19(.004)	.10(.003)	**.04(.002)**	**.01(.001)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.22(.003)	.42(.003)	.52(.003)	.63(.002)	.74(.002)
16	Total	.70(.014)	.63(.014)	.59(.014)	.56(.012)	.53(.013)
	25%	.59(.029)	.39(.031)	.29(.028)	.21(.025)	.14(.022)
	50%	.70(.028)	.62(.031)	.57(.030)	.53(.030)	.49(.032)
	75%	.75(.028)	.74(.027)	.73(.029)	.72(.028)	.71(.029)
	100%	.77(.026)	.77(.028)	.77(.027)	.77(.025)	.77(.026)
	Error	.41(.005)	.12(.003)	**.03(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.54(.002)	.64(.001)	.75(.001)
24	Total	.74(.014)	.65(.014)	.61(.013)	.57(.013)	.54(.012)
	25%	.60(.029)	.35(.029)	.25(.028)	.16(.022)	.10(.018)
	50%	.74(.028)	.65(.032)	.59(.030)	.54(.033)	.49(.031)
	75%	**.81(.024)**	.78(.026)	.78(.024)	.76(.025)	.76(.026)
	100%	**.83(.022)**	**.83(.024)**	**.82(.023)**	**.83(.026)**	**.82(.025)**
	Error	.38(.005)	.06(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.75(.001)
32	Total	.78(.013)	.67(.013)	.62(.013)	.59(.013)	.55(.011)
	25%	.62(.031)	.33(.028)	.20(.026)	.13(.022)	.06(.014)
	50%	.77(.028)	.67(.028)	.60(.030)	.55(.032)	.48(.032)
	75%	**.84(.022)**	**.83(.024)**	**.82(.025)**	**.80(.025)**	.79(.027)
	100%	**.86(.022)**	**.86(.021)**	**.86(.024)**	**.86(.022)**	**.86(.021)**
	Error	.36(.005)	**.03(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.65(.001)	.76(.001)
		Random Uniform Responding				
8	Total	.65(.014)	.61(.015)	.59(.016)	.57(.016)	.55(.014)
	25%	.57(.031)	.47(.034)	.41(.031)	.36(.028)	.31(.028)
	50%	.65(.031)	.61(.029)	.59(.031)	.57(.032)	.55(.032)
	75%	.68(.029)	.67(.031)	.67(.031)	.66(.031)	.66(.029)

	100%	.68(.027)	.69(.031)	.68(.029)	.68(.029)	.68(.028)
	Error	.43(.005)	.19(.004)	.10(.003)	**.04(.002)**	**.01(.001)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.21(.003)	.42(.003)	.52(.003)	.62(.002)	.73(.002)
16	Total	.72(.015)	.66(.015)	.64(.014)	.61(.014)	.58(.014)
	25%	.63(.030)	.46(.032)	.38(.031)	.31(.029)	.25(.028)
	50%	.72(.030)	.66(.030)	.64(.029)	.62(.029)	.58(.031)
	75%	.76(.028)	.74(.027)	.74(.027)	.74(.027)	.74(.027)
	100%	.77(.027)	.76(.028)	.77(.026)	.77(.026)	.77(.026)
	Error	.41(.005)	.12(.003)	**.03(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.53(.002)	.64(.001)	.75(.001)
24	Total	.77(.013)	.70(.014)	.67(.012)	.63(.014)	.60(.013)
	25%	.66(.029)	.45(.030)	.36(.028)	.27(.028)	.20(.027)
	50%	.77(.028)	.71(.030)	.68(.031)	.64(.031)	.61(.030)
	75%	**.81(.023)**	**.81(.026)**	**.80(.025)**	.79(.026)	.79(.025)
	100%	**.83(.024)**	**.83(.024)**	**.83(.022)**	**.83(.025)**	**.82(.024)**
	Error	.38(.005)	.06(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.74(.001)
32	Total	**.80(.011)**	.72(.012)	.69(.013)	.65(.014)	.62(.013)
	25%	.68(.028)	.45(.029)	.33(.029)	.24(.029)	.16(.024)
	50%	**.80(.022)**	.74(.028)	.70(.030)	.67(.030)	.63(.033)
	75%	**.85(.022)**	**.84(.023)**	**.84(.023)**	**.83(.022)**	**.83(.025)**
	100%	**.86(.022)**	**.86(.021)**	**.86(.021)**	**.86(.022)**	**.86(.021)**
	Error	.36(.005)	**.03(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.64(.001)	.75(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 4.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .3 and dependence of 0.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.72(.015)	.67(.015)	.64(.014)	.62(.015)	.59(.015)
	25%	.64(.031)	.51(.032)	.44(.032)	.37(.032)	.30(.030)
	50%	.71(.029)	.67(.028)	.64(.031)	.61(.030)	.58(.030)
	75%	.75(.028)	.75(.029)	.74(.028)	.73(.029)	.72(.027)
	100%	.76(.025)	.76(.026)	.76(.026)	.76(.025)	.77(.027)
	Error	.53(.005)	.26(.005)	.15(.004)	.07(.003)	**.02(.001)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.22(.003)	.42(.003)	.52(.003)	.63(.002)	.74(.002)
16	Total	**.82(.013)**	.75(.013)	.71(.013)	.68(.013)	.64(.013)
	25%	.73(.028)	.55(.032)	.43(.030)	.33(.030)	.24(.028)
	50%	**.82(.024)**	.75(.026)	.71(.027)	.68(.031)	.63(.030)
	75%	**.86(.022)**	**.85(.022)**	**.84(.025)**	**.83(.024)**	**.82(.023)**
	100%	**.87(.023)**	**.87(.022)**	**.87(.022)**	**.87(.020)**	**.87(.023)**
	Error	.57(.005)	.21(.004)	.07(.003)	**.01(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.54(.002)	.64(.001)	.75(.001)
24	Total	**.87(.011)**	.79(.012)	.75(.012)	.70(.012)	.67(.012)
	25%	.77(.027)	.54(.030)	.42(.030)	.29(.027)	.20(.025)
	50%	**.87(.022)**	**.81(.026)**	.76(.027)	.71(.031)	.67(.029)
	75%	**.91(.018)**	**.90(.018)**	**.90(.019)**	**.89(.019)**	**.88(.021)**
	100%	**.92(.016)**	**.92(.017)**	**.92(.017)**	**.92(.019)**	**.92(.017)**
	Error	.58(.005)	.14(.004)	**.03(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.75(.001)
32	Total	**.90(.010)**	**.82(.011)**	.77(.011)	.73(.011)	.68(.009)
	25%	**.81(.024)**	.56(.030)	.40(.030)	.27(.027)	.16(.021)
	50%	**.90(.018)**	**.84(.021)**	.79(.024)	.75(.027)	.69(.028)
	75%	**.94(.015)**	**.93(.016)**	**.93(.017)**	**.92(.018)**	**.92(.017)**
	100%	**.95(.014)**	**.95(.013)**	**.95(.013)**	**.95(.014)**	**.95(.013)**
	Error	.59(.005)	.11(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.65(.001)	.76(.001)
		Random Uniform Responding				
8	Total	.73(.014)	.70(.014)	.68(.015)	.66(.014)	.64(.014)
	25%	.67(.032)	.57(.034)	.51(.032)	.45(.028)	.40(.029)
	50%	.73(.028)	.70(.028)	.68(.031)	.67(.029)	.65(.029)
	75%	.76(.027)	.76(.026)	.75(.029)	.75(.027)	.75(.027)

	100%	.77(.026)	.77(.027)	.77(.027)	.76(.028)	.76(.025)
	Error	.53(.005)	.26(.005)	.15(.004)	.07(.003)	**.02(.001)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.21(.003)	.42(.003)	.52(.003)	.62(.002)	.73(.002)
16	Total	**.83(.012)**	.78(.013)	.76(.013)	.73(.013)	.70(.012)
	25%	.76(.029)	.62(.032)	.53(.031)	.45(.031)	.37(.030)
	50%	**.83(.024)**	.79(.024)	.77(.026)	.75(.027)	.72(.028)
	75%	**.86(.023)**	**.85(.022)**	**.85(.023)**	**.85(.022)**	**.85(.023)**
	100%	**.87(.022)**	**.86(.023)**	**.87(.020)**	**.87(.021)**	**.87(.020)**
	Error	.57(.005)	.21(.004)	.07(.003)	**.01(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.53(.002)	.64(.001)	.75(.001)
24	Total	**.88(.009)**	**.83(.011)**	**.80(.011)**	.77(.013)	.74(.012)
	25%	**.81(.023)**	.64(.028)	.55(.029)	.44(.033)	.35(.032)
	50%	**.89(.021)**	**.85(.022)**	**.83(.024)**	**.80(.025)**	.77(.027)
	75%	**.91(.017)**	**.91(.020)**	**.91(.019)**	**.90(.019)**	**.90(.019)**
	100%	**.92(.017)**	**.92(.016)**	**.93(.017)**	**.92(.018)**	**.92(.016)**
	Error	.58(.005)	.14(.004)	**.03(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.74(.001)
32	Total	**.92(.008)**	**.86(.010)**	**.83(.010)**	.79(.011)	.75(.011)
	25%	**.85(.023)**	.67(.029)	.55(.031)	.44(.034)	.32(.031)
	50%	**.92(.016)**	**.89(.020)**	**.86(.021)**	**.84(.022)**	**.81(.025)**
	75%	**.95(.014)**	**.94(.014)**	**.94(.016)**	**.94(.016)**	**.93(.016)**
	100%	**.95(.014)**	**.95(.014)**	**.95(.014)**	**.95(.015)**	**.95(.014)**
	Error	.59(.005)	.11(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.64(.001)	.75(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 5.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .1 and dependence of 0.25.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	**.80(.012)**	.76(.014)	.73(.014)	.71(.014)	.68(.014)
	25%	.74(.028)	.61(.030)	.54(.032)	.47(.033)	.40(.032)
	50%	**.80(.026)**	.75(.027)	.73(.027)	.71(.030)	.68(.028)
	75%	**.83(.025)**	**.82(.026)**	**.82(.024)**	**.81(.025)**	**.80(.025)**
	100%	**.83(.022)**	**.84(.024)**	**.84(.024)**	**.83(.023)**	**.84(.024)**
	Error	.63(.005)	.36(.005)	.23(.004)	.11(.003)	**.03(.002)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.22(.003)	.42(.003)	.52(.003)	.63(.002)	.74(.002)
16	Total	**.90(.009)**	**.86(.012)**	**.82(.011)**	.79(.012)	.74(.011)
	25%	**.85(.022)**	.70(.031)	.59(.030)	.48(.030)	.37(.031)
	50%	**.90(.018)**	**.86(.022)**	**.83(.023)**	**.80(.026)**	.77(.027)
	75%	**.93(.017)**	**.93(.017)**	**.92(.018)**	**.91(.017)**	**.91(.019)**
	100%	**.94(.016)**	**.94(.016)**	**.94(.016)**	**.94(.015)**	**.94(.015)**
	Error	.72(.004)	.35(.004)	.15(.004)	**.04(.002)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.54(.002)	.64(.001)	.75(.001)
24	Total	**.95(.007)**	**.90(.009)**	**.86(.010)**	**.82(.010)**	.78(.010)
	25%	**.90(.020)**	.73(.029)	.62(.031)	.48(.032)	.35(.029)
	50%	**.95(.014)**	**.91(.017)**	**.89(.018)**	**.86(.023)**	**.83(.024)**
	75%	**.97(.011)**	**.96(.012)**	**.96(.013)**	**.96(.013)**	**.95(.013)**
	100%	**.97(.010)**	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.011)**
	Error	.76(.004)	.29(.005)	.10(.003)	**.01(.001)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.75(.001)
32	Total	**.97(.005)**	**.92(.008)**	**.88(.009)**	**.84(.010)**	.79(.009)
	25%	**.93(.015)**	.77(.026)	.63(.031)	.49(.031)	.33(.032)
	50%	**.97(.010)**	**.95(.015)**	**.92(.016)**	**.90(.019)**	**.86(.021)**
	75%	**.99(.008)**	**.98(.008)**	**.98(.008)**	**.98(.009)**	**.98(.010)**
	100%	**.99(.007)**	**.99(.006)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.80(.004)	.27(.004)	.06(.003)	**.01(.001)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.65(.001)	.76(.001)
		Random Uniform Responding				
8	Total	**.81(.012)**	.78(.013)	.76(.013)	.74(.013)	.72(.013)
	25%	.76(.028)	.66(.031)	.61(.032)	.55(.031)	.50(.027)
	50%	**.81(.023)**	.78(.024)	.77(.028)	.75(.029)	.74(.027)
	75%	**.83(.023)**	**.83(.024)**	**.82(.024)**	**.82(.024)**	**.82(.022)**

	100%	**.84(.023)**	**.84(.023)**	**.84(.023)**	**.83(.024)**	**.84(.022)**
	Error	.63(.005)	.36(.005)	.23(.004)	.11(.003)	**.03(.002)**
	Pre	.23(.003)	.46(.003)	.57(.003)	.68(.002)	.80(.002)
	Post	.21(.003)	.42(.003)	.52(.003)	.62(.002)	.73(.002)
16	Total	**.91(.009)**	**.88(.011)**	**.86(.010)**	**.83(.010)**	**.81(.011)**
	25%	**.87(.022)**	.76(.031)	.69(.028)	.61(.030)	.52(.032)
	50%	**.92(.018)**	**.89(.019)**	**.88(.021)**	**.86(.021)**	**.84(.023)**
	75%	**.93(.017)**	**.92(.016)**	**.93(.016)**	**.92(.016)**	**.92(.018)**
	100%	**.94(.016)**	**.93(.016)**	**.94(.015)**	**.94(.015)**	**.94(.015)**
	Error	.72(.004)	.35(.004)	.15(.004)	**.04(.002)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.002)	.69(.001)	.82(.001)
	Post	.22(.002)	.42(.002)	.53(.002)	.64(.001)	.75(.001)
24	Total	**.95(.006)**	**.92(.008)**	**.90(.009)**	**.87(.010)**	**.84(.011)**
	25%	**.92(.017)**	**.81(.024)**	.73(.029)	.64(.031)	.54(.033)
	50%	**.96(.014)**	**.94(.015)**	**.93(.018)**	**.91(.019)**	**.89(.020)**
	75%	**.97(.011)**	**.97(.011)**	**.97(.012)**	**.96(.012)**	**.96(.012)**
	100%	**.97(.010)**	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.010)**
	Error	.76(.004)	.29(.005)	.10(.003)	**.01(.001)**	**.00(.000)**
	Pre	.25(.002)	.48(.002)	.59(.001)	.71(.001)	.81(.001)
	Post	.23(.002)	.44(.002)	.54(.001)	.65(.001)	.74(.001)
32	Total	**.98(.004)**	**.95(.007)**	**.92(.008)**	**.90(.009)**	**.86(.008)**
	25%	**.95(.012)**	**.85(.024)**	.77(.028)	.67(.031)	.54(.029)
	50%	**.98(.009)**	**.96(.012)**	**.96(.014)**	**.94(.014)**	**.93(.016)**
	75%	**.99(.007)**	**.98(.008)**	**.98(.008)**	**.98(.008)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.80(.004)	.27(.004)	.06(.003)	**.01(.001)**	**.00(.000)**
	Pre	.25(.002)	.48(.001)	.60(.001)	.70(.001)	.82(.001)
	Post	.23(.002)	.44(.001)	.55(.001)	.64(.001)	.75(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 6.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .4 and dependence of 0.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.54(.015)	.51(.016)	.48(.017)	.47(.016)	.45(.014)
	25%	.46(.028)	.37(.032)	.30(.028)	.26(.030)	.21(.025)
	50%	.54(.030)	.50(.032)	.47(.031)	.45(.032)	.43(.029)
	75%	.58(.032)	.57(.034)	.57(.030)	.57(.032)	.56(.032)
	100%	.59(.031)	.60(.030)	.59(.032)	.59(.031)	.59(.030)
	Error	.36(.005)	.19(.004)	.10(.003)	**.04(.002)**	**.01(.001)**
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.48(.003)	.58(.003)	.70(.002)
16	Total	.58(.015)	.52(.015)	.49(.015)	.46(.014)	.44(.015)
	25%	.47(.031)	.31(.029)	.23(.026)	.18(.024)	.14(.022)
	50%	.57(.029)	.50(.031)	.47(.029)	.44(.030)	.41(.030)
	75%	.63(.030)	.61(.032)	.60(.029)	.60(.029)	.59(.031)
	100%	.64(.029)	.64(.030)	.65(.030)	.64(.030)	.65(.031)
	Error	.33(.005)	.09(.003)	**.03(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.59(.002)	.70(.001)
24	Total	.59(.016)	.52(.015)	.48(.015)	.46(.014)	.43(.014)
	25%	.45(.031)	.26(.025)	.18(.025)	.13(.022)	.08(.018)
	50%	.58(.031)	.50(.031)	.45(.030)	.42(.032)	.37(.030)
	75%	.66(.030)	.64(.029)	.63(.030)	.62(.029)	.61(.031)
	100%	.67(.030)	.68(.030)	.68(.029)	.68(.030)	.68(.030)
	Error	.26(.005)	**.04(.002)**	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.40(.002)	.50(.002)	.59(.001)	.73(.001)
32	Total	.61(.014)	.52(.015)	.49(.015)	.46(.014)	.44(.014)
	25%	.44(.032)	.23(.026)	.15(.022)	.09(.016)	.05(.013)
	50%	.60(.031)	.50(.031)	.45(.032)	.41(.029)	.36(.029)
	75%	.68(.028)	.66(.031)	.65(.030)	.64(.032)	.63(.034)
	100%	.71(.028)	.71(.027)	.71(.030)	.71(.026)	.71(.028)
	Error	.23(.004)	**.02(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)
		Random Uniform Responding				
8	Total	.56(.016)	.52(.015)	.51(.015)	.50(.015)	.48(.016)
	25%	.49(.032)	.41(.031)	.36(.029)	.32(.029)	.28(.029)
	50%	.56(.032)	.53(.032)	.52(.033)	.50(.031)	.48(.031)
	75%	.59(.033)	.57(.033)	.58(.030)	.58(.030)	.57(.031)

	100%	.59(.031)	.59(.029)	.59(.031)	.59(.031)	.59(.031)
	Error	.36(.005)	.19(.004)	.10(.003)	**.04(.002)**	**.01(.001)**
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.47(.003)	.58(.003)	.69(.002)
16	Total	.59(.015)	.55(.015)	.52(.014)	.51(.015)	.49(.014)
	25%	.51(.032)	.37(.029)	.31(.028)	.25(.025)	.21(.026)
	50%	.59(.030)	.55(.033)	.53(.030)	.50(.030)	.49(.032)
	75%	.63(.028)	.63(.032)	.62(.029)	.62(.031)	.61(.030)
	100%	.64(.028)	.65(.030)	.64(.030)	.64(.031)	.64(.030)
	Error	.33(.005)	.09(.003)	**.03(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.58(.002)	.70(.001)
24	Total	.61(.016)	.56(.015)	.53(.014)	.51(.014)	.49(.015)
	25%	.49(.030)	.33(.030)	.27(.027)	.21(.025)	.15(.021)
	50%	.62(.033)	.56(.030)	.53(.030)	.51(.032)	.48(.031)
	75%	.67(.030)	.66(.031)	.65(.027)	.64(.030)	.64(.032)
	100%	.68(.030)	.68(.029)	.68(.031)	.68(.031)	.68(.030)
	Error	.26(.005)	**.04(.002)**	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.002)	.59(.001)	.73(.001)
32	Total	.63(.015)	.57(.015)	.54(.014)	.52(.014)	.49(.014)
	25%	.49(.032)	.32(.030)	.24(.029)	.17(.023)	.12(.021)
	50%	.63(.031)	.57(.029)	.54(.030)	.51(.032)	.47(.031)
	75%	.69(.029)	.68(.030)	.68(.030)	.67(.030)	.66(.029)
	100%	.71(.029)	.71(.030)	.71(.028)	.71(.031)	.71(.030)
	Error	.23(.004)	**.02(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 7.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .2 and dependence of 0.25.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.63(.015)	.60(.015)	.57(.017)	.55(.016)	.53(.015)
	25%	.56(.030)	.47(.032)	.39(.031)	.33(.032)	.28(.028)
	50%	.63(.029)	.59(.032)	.57(.031)	.54(.032)	.52(.029)
	75%	.66(.031)	.66(.032)	.66(.032)	.66(.029)	.65(.030)
	100%	.68(.029)	.68(.030)	.68(.030)	.68(.030)	.68(.029)
	Error	.45(.005)	.26(.005)	.14(.004)	.06(.003)	**.02(.001)**
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.48(.003)	.58(.003)	.70(.002)
16	Total	.71(.014)	.65(.016)	.62(.014)	.59(.013)	.57(.014)
	25%	.62(.031)	.44(.032)	.36(.028)	.28(.027)	.22(.027)
	50%	.71(.026)	.64(.031)	.61(.029)	.58(.031)	.55(.032)
	75%	.76(.027)	.74(.030)	.74(.025)	.73(.027)	.72(.027)
	100%	.77(.027)	.77(.027)	.77(.027)	.77(.025)	.77(.029)
	Error	.47(.005)	.16(.004)	.06(.003)	**.01(.001)**	**.00(.000)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.59(.002)	.70(.001)
24	Total	.75(.013)	.68(.014)	.64(.013)	.61(.013)	.57(.014)
	25%	.63(.030)	.42(.031)	.32(.033)	.25(.027)	.15(.022)
	50%	.75(.028)	.68(.030)	.63(.029)	.60(.033)	.55(.030)
	75%	**.81(.026)**	.79(.025)	.79(.025)	.78(.025)	.77(.029)
	100%	**.82(.023)**	**.83(.024)**	**.83(.024)**	**.82(.024)**	**.82(.024)**
	Error	.43(.005)	.10(.003)	**.02(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.40(.002)	.50(.002)	.59(.001)	.73(.001)
32	Total	.79(.013)	.71(.013)	.66(.013)	.63(.012)	.59(.012)
	25%	.65(.030)	.42(.030)	.30(.027)	.21(.024)	.12(.021)
	50%	.79(.025)	.71(.028)	.66(.030)	.62(.029)	.56(.031)
	75%	**.85(.023)**	**.83(.025)**	**.83(.023)**	**.82(.024)**	**.81(.025)**
	100%	**.86(.022)**	**.86(.021)**	**.87(.021)**	**.87(.022)**	**.87(.020)**
	Error	.42(.005)	.07(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)
		Random Uniform Responding				
8	Total	.65(.016)	.62(.015)	.60(.014)	.59(.015)	.57(.015)
	25%	.58(.031)	.50(.032)	.45(.031)	.41(.032)	.36(.032)
	50%	.65(.031)	.62(.031)	.61(.032)	.59(.030)	.58(.031)
	75%	.68(.030)	.66(.030)	.67(.028)	.67(.028)	.66(.029)

	100%	.68(.031)	.68(.027)	.68(.028)	.68(.030)	.68(.028)
	Error	.45(.005)	.26(.005)	.14(.004)	.06(.003)	**.02(.001)**
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.47(.003)	.58(.003)	.69(.002)
	Total	.73(.013)	.68(.014)	.66(.013)	.64(.015)	.62(.014)
	25%	.65(.027)	.52(.030)	.45(.031)	.38(.030)	.33(.031)
	50%	.73(.027)	.69(.030)	.67(.029)	.65(.029)	.63(.030)
16	75%	.76(.026)	.75(.027)	.75(.026)	.75(.028)	.74(.026)
	100%	.77(.028)	.77(.028)	.77(.025)	.77(.026)	.77(.027)
	Error	.47(.005)	.16(.004)	.06(.003)	**.01(.001)**	**.00(.000)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.58(.002)	.70(.001)
	Total	.77(.014)	.72(.013)	.69(.014)	.67(.014)	.64(.013)
	25%	.68(.030)	.52(.032)	.43(.031)	.37(.032)	.27(.027)
	50%	.78(.026)	.73(.028)	.71(.028)	.69(.029)	.66(.029)
24	75%	**.82(.025)**	**.81(.024)**	**.80(.025)**	**.80(.025)**	.79(.025)
	100%	**.83(.025)**	**.83(.024)**	**.82(.026)**	**.82(.024)**	**.83(.023)**
	Error	.43(.005)	.10(.003)	**.02(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.002)	.59(.001)	.73(.001)
	Total	**.81(.012)**	.75(.013)	.72(.013)	.69(.012)	.66(.013)
	25%	.70(.028)	.53(.031)	.43(.030)	.34(.028)	.25(.028)
	50%	**.81(.025)**	.77(.026)	.74(.028)	.72(.029)	.68(.028)
32	75%	**.86(.021)**	**.84(.024)**	**.84(.024)**	**.84(.023)**	**.84(.024)**
	100%	**.86(.023)**	**.86(.022)**	**.87(.020)**	**.87(.022)**	**.86(.021)**
	Error	.42(.005)	.07(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 8.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .3 and dependence of 0.25.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.72(.014)	.69(.014)	.66(.017)	.64(.015)	.62(.015)
	25%	.66(.030)	.56(.031)	.48(.032)	.42(.033)	.37(.029)
	50%	.72(.026)	.69(.030)	.66(.029)	.64(.030)	.62(.029)
	75%	.75(.029)	.75(.028)	.75(.029)	.74(.027)	.73(.028)
	100%	.76(.026)	.77(.028)	.76(.027)	.76(.027)	.76(.027)
	Error	.55(.005)	.35(.005)	.20(.004)	.10(.003)	**.03(.002)**
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.48(.003)	.58(.003)	.70(.002)
16	Total	**.83(.012)**	.77(.014)	.74(.014)	.71(.012)	.68(.013)
	25%	.76(.030)	.60(.033)	.51(.032)	.42(.032)	.34(.029)
	50%	**.82(.024)**	.77(.027)	.75(.027)	.72(.027)	.69(.030)
	75%	**.86(.023)**	**.85(.022)**	**.85(.021)**	**.84(.022)**	**.83(.023)**
	100%	**.87(.020)**	**.87(.021)**	**.87(.023)**	**.87(.020)**	**.87(.023)**
	Error	.62(.005)	.27(.005)	.12(.004)	**.04(.002)**	**.00(.001)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.59(.002)	.70(.001)
24	Total	**.88(.011)**	**.82(.012)**	.78(.012)	.75(.012)	.70(.012)
	25%	**.80(.026)**	.62(.030)	.50(.034)	.41(.029)	.29(.027)
	50%	**.88(.022)**	**.83(.024)**	.79(.026)	.77(.027)	.72(.028)
	75%	**.92(.018)**	**.90(.018)**	**.90(.020)**	**.90(.019)**	**.89(.021)**
	100%	**.92(.016)**	**.92(.017)**	**.92(.016)**	**.92(.016)**	**.92(.017)**
	Error	.63(.005)	.22(.004)	.07(.003)	**.01(.001)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.40(.002)	.50(.002)	.59(.001)	.73(.001)
32	Total	**.91(.010)**	**.85(.010)**	**.81(.011)**	.77(.011)	.72(.012)
	25%	**.84(.024)**	.64(.030)	.52(.034)	.39(.031)	.26(.028)
	50%	**.91(.018)**	**.87(.022)**	**.83(.024)**	**.80(.025)**	.76(.029)
	75%	**.94(.015)**	**.94(.016)**	**.93(.014)**	**.93(.016)**	**.92(.018)**
	100%	**.95(.014)**	**.95(.014)**	**.95(.014)**	**.95(.012)**	**.95(.012)**
	Error	.65(.005)	.19(.004)	.05(.002)	**.00(.001)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)
		Random Uniform Responding				
8	Total	.74(.014)	.70(.014)	.69(.013)	.68(.014)	.66(.015)
	25%	.68(.029)	.60(.032)	.55(.032)	.50(.034)	.45(.033)
	50%	.73(.030)	.71(.027)	.70(.031)	.69(.028)	.67(.030)
	75%	.76(.027)	.75(.027)	.75(.026)	.75(.026)	.75(.027)

	100%	.77(.028)	.76(.025)	.76(.026)	.77(.024)	.77(.026)
	Error	.55(.005)	.35(.005)	.20(.004)	.10(.003)	**.03(.002)**
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.47(.003)	.58(.003)	.69(.002)
16	Total	**.84(.011)**	**.80(.012)**	.78(.012)	.76(.013)	.74(.014)
	25%	.78(.024)	.66(.029)	.60(.031)	.53(.030)	.47(.033)
	50%	**.84(.022)**	**.81(.024)**	**.80(.026)**	.78(.026)	.76(.026)
	75%	**.86(.020)**	**.86(.022)**	**.86(.023)**	**.85(.022)**	**.85(.022)**
	100%	**.87(.021)**	**.87(.022)**	**.87(.020)**	**.87(.021)**	**.87(.022)**
	Error	.62(.005)	.27(.005)	.12(.004)	**.04(.002)**	**.00(.001)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.58(.002)	.70(.001)
24	Total	**.89(.010)**	**.85(.011)**	**.83(.012)**	**.80(.011)**	.77(.012)
	25%	**.83(.025)**	.70(.030)	.62(.031)	.55(.032)	.44(.034)
	50%	**.89(.017)**	**.87(.023)**	**.85(.021)**	**.83(.023)**	**.81(.024)**
	75%	**.92(.017)**	**.91(.017)**	**.91(.018)**	**.91(.020)**	**.90(.019)**
	100%	**.92(.018)**	**.92(.018)**	**.92(.017)**	**.92(.017)**	**.92(.016)**
	Error	.63(.005)	.22(.004)	.07(.003)	**.01(.001)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.002)	.59(.001)	.73(.001)
32	Total	**.92(.008)**	**.89(.010)**	**.86(.011)**	**.83(.011)**	**.80(.011)**
	25%	**.87(.021)**	.74(.028)	.65(.029)	.56(.032)	.44(.030)
	50%	**.93(.017)**	**.90(.019)**	**.89(.018)**	**.87(.021)**	**.85(.020)**
	75%	**.95(.014)**	**.94(.014)**	**.94(.015)**	**.94(.015)**	**.94(.016)**
	100%	**.95(.014)**	**.95(.014)**	**.95(.014)**	**.95(.013)**	**.95(.014)**
	Error	.65(.005)	.19(.004)	.05(.002)	**.00(.001)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs.

Table 9.
Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .4 and dependence of 0.25.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	**.80(.012)**	.78(.013)	.75(.014)	.73(.014)	.70(.014)
	25%	.75(.028)	.67(.030)	.59(.031)	.53(.033)	.46(.031)
	50%	**.80(.024)**	.77(.026)	.75(.026)	.73(.029)	.71(.028)
	75%	**.83(.023)**	**.82(.023)**	**.82(.026)**	**.82(.025)**	**.81(.026)**
	100%	**.84(.023)**	**.84(.024)**	**.84(.024)**	**.83(.023)**	**.84(.023)**
	Error	.65(.005)	.45(.005)	.29(.005)	.16(.004)	.05(.002)
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.48(.003)	.58(.003)	.70(.002)
16	Total	**.91(.009)**	**.87(.011)**	**.85(.011)**	**.82(.012)**	.79(.011)
	25%	**.87(.023)**	.75(.030)	.66(.030)	.58(.031)	.49(.031)
	50%	**.91(.018)**	**.88(.021)**	**.86(.022)**	**.84(.022)**	**.81(.024)**
	75%	**.93(.016)**	**.93(.016)**	**.92(.016)**	**.92(.017)**	**.92(.018)**
	100%	**.94(.016)**	**.94(.015)**	**.94(.015)**	**.94(.015)**	**.94(.016)**
	Error	.77(.004)	.43(.005)	.22(.005)	.08(.003)	**.01(.001)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.59(.002)	.70(.001)
24	Total	**.95(.007)**	**.91(.008)**	**.89(.009)**	**.86(.010)**	**.81(.010)**
	25%	**.91(.018)**	.79(.025)	.70(.027)	.61(.030)	.47(.030)
	50%	**.95(.014)**	**.93(.015)**	**.91(.018)**	**.89(.020)**	**.86(.022)**
	75%	**.97(.011)**	**.96(.012)**	**.96(.013)**	**.96(.013)**	**.96(.013)**
	100%	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.011)**
	Error	.80(.004)	.40(.005)	.17(.004)	.05(.002)	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.40(.002)	.50(.002)	.59(.001)	.73(.001)
32	Total	**.97(.006)**	**.94(.007)**	**.91(.008)**	**.88(.009)**	**.83(.010)**
	25%	**.94(.015)**	**.84(.023)**	.74(.028)	.62(.031)	.47(.032)
	50%	**.97(.009)**	**.96(.013)**	**.94(.015)**	**.93(.017)**	**.90(.019)**
	75%	**.99(.007)**	**.98(.008)**	**.98(.008)**	**.98(.009)**	**.98(.009)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.84(.004)	.40(.005)	.14(.004)	**.02(.002)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)
		Random Uniform Responding				
8	Total	**.81(.014)**	.78(.012)	.77(.012)	.76(.013)	.74(.013)
	25%	.77(.028)	.69(.029)	.65(.031)	.60(.032)	.55(.031)
	50%	**.81(.028)**	.79(.025)	.78(.027)	.77(.027)	.76(.027)
	75%	**.83(.024)**	**.82(.024)**	**.83(.022)**	**.82(.025)**	**.82(.024)**

	100%	**.84(.026)**	**.83(.022)**	**.84(.022)**	**.84(.022)**	**.84(.023)**
	Error	.65(.005)	.45(.005)	.29(.005)	.16(.004)	.05(.002)
	Pre	.22(.004)	.39(.003)	.52(.003)	.63(.002)	.76(.002)
	Post	.20(.004)	.36(.003)	.47(.003)	.58(.003)	.69(.002)
	Total	**.92(.008)**	**.89(.009)**	**.87(.010)**	**.85(.011)**	**.84(.011)**
	25%	**.88(.019)**	**.80(.026)**	.74(.027)	.68(.026)	.62(.032)
	50%	**.92(.019)**	**.90(.018)**	**.89(.020)**	**.88(.020)**	**.87(.021)**
16	75%	**.93(.016)**	**.93(.016)**	**.93(.015)**	**.93(.016)**	**.93(.016)**
	100%	**.94(.015)**	**.94(.015)**	**.94(.016)**	**.94(.017)**	**.94(.016)**
	Error	.77(.004)	.43(.005)	.22(.005)	.08(.003)	**.01(.001)**
	Pre	.21(.002)	.42(.002)	.53(.002)	.64(.002)	.76(.001)
	Post	.19(.002)	.38(.002)	.49(.002)	.58(.002)	.70(.001)
	Total	**.96(.006)**	**.93(.008)**	**.92(.008)**	**.90(.009)**	**.87(.010)**
	25%	**.93(.017)**	**.85(.023)**	.79(.025)	.74(.029)	.63(.033)
	50%	**.96(.011)**	**.95(.014)**	**.94(.014)**	**.93(.016)**	**.91(.017)**
24	75%	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.012)**	**.96(.011)**
	100%	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.010)**
	Error	.80(.004)	.40(.005)	.17(.004)	.05(.002)	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.64(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.002)	.59(.001)	.73(.001)
	Total	**.98(.005)**	**.96(.006)**	**.94(.007)**	**.92(.008)**	**.89(.009)**
	25%	**.96(.013)**	**.89(.021)**	**.84(.024)**	.76(.026)	.66(.030)
	50%	**.98(.009)**	**.97(.011)**	**.96(.012)**	**.96(.013)**	**.95(.014)**
32	75%	**.99(.007)**	**.99(.008)**	**.98(.008)**	**.98(.008)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.84(.004)	.40(.005)	.14(.004)	**.02(.002)**	**.00(.000)**
	Pre	.23(.002)	.43(.002)	.54(.001)	.65(.001)	.79(.001)
	Post	.21(.002)	.39(.002)	.49(.001)	.60(.001)	.72(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 10.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .1 and dependence of 0.5.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.55(.016)	.53(.016)	.51(.016)	.49(.016)	.48(.016)
	25%	.49(.032)	.42(.032)	.37(.032)	.33(.030)	.28(.029)
	50%	.55(.032)	.52(.034)	.51(.033)	.49(.034)	.47(.033)
	75%	.58(.030)	.58(.030)	.58(.034)	.57(.030)	.57(.031)
	100%	.59(.034)	.59(.031)	.59(.030)	.59(.034)	.59(.031)
	Error	.40(.005)	.25(.004)	.17(.004)	.08(.003)	**.03(.002)**
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.17(.004)	.30(.003)	.39(.003)	.50(.003)	.63(.002)
16	Total	.59(.016)	.55(.016)	.52(.016)	.50(.016)	.48(.014)
	25%	.51(.032)	.39(.031)	.31(.029)	.25(.025)	.20(.025)
	50%	.59(.031)	.54(.031)	.51(.032)	.48(.032)	.46(.032)
	75%	.63(.030)	.62(.029)	.61(.031)	.61(.031)	.60(.029)
	100%	.65(.030)	.64(.031)	.65(.031)	.65(.033)	.64(.031)
	Error	.38(.005)	.17(.004)	.06(.003)	**.02(.001)**	**.00(.000)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	.62(.015)	.56(.015)	.53(.016)	.50(.015)	.48(.015)
	25%	.52(.032)	.36(.028)	.28(.027)	.21(.027)	.15(.022)
	50%	.61(.031)	.55(.033)	.52(.030)	.48(.034)	.45(.034)
	75%	.67(.030)	.65(.031)	.65(.032)	.63(.031)	.63(.032)
	100%	.68(.030)	.68(.029)	.68(.029)	.68(.029)	.68(.030)
	Error	.38(.005)	.11(.003)	**.03(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.31(.002)	.41(.002)	.52(.002)	.66(.001)
32	Total	.63(.015)	.58(.015)	.54(.014)	.50(.015)	.48(.013)
	25%	.51(.032)	.36(.031)	.26(.028)	.17(.025)	.12(.020)
	50%	.63(.032)	.57(.032)	.53(.030)	.48(.031)	.44(.032)
	75%	.69(.030)	.67(.029)	.67(.031)	.65(.030)	.65(.028)
	100%	.70(.029)	.71(.030)	.71(.028)	.71(.029)	.70(.026)
	Error	.34(.005)	.09(.003)	**.02(.002)**	**.00(.000)**	**.00(.000)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.53(.001)	.65(.001)
		Random Uniform Responding				
8	Total	.56(.015)	.54(.014)	.54(.015)	.52(.014)	.51(.015)
	25%	.51(.034)	.45(.029)	.42(.029)	.38(.031)	.35(.032)
	50%	.56(.031)	.55(.031)	.54(.033)	.53(.033)	.51(.033)
	75%	.59(.029)	.58(.031)	.58(.032)	.58(.029)	.58(.033)

	100%	.59(.031)	.60(.033)	.59(.032)	.59(.031)	.59(.030)
	Error	.40(.005)	.25(.004)	.17(.004)	.08(.003)	**.03(.002)**
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.16(.004)	.30(.003)	.38(.003)	.50(.003)	.63(.002)
16	Total	.61(.015)	.57(.015)	.55(.015)	.54(.016)	.52(.015)
	25%	.54(.032)	.44(.030)	.38(.029)	.34(.029)	.29(.030)
	50%	.61(.032)	.58(.033)	.56(.032)	.54(.032)	.53(.032)
	75%	.64(.031)	.63(.031)	.63(.028)	.63(.031)	.62(.029)
	100%	.65(.030)	.64(.030)	.64(.032)	.64(.028)	.65(.031)
	Error	.38(.005)	.17(.004)	.06(.003)	**.02(.001)**	**.00(.000)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	.63(.013)	.59(.015)	.57(.015)	.55(.014)	.53(.014)
	25%	.55(.030)	.43(.029)	.37(.030)	.30(.029)	.25(.028)
	50%	.64(.030)	.60(.031)	.58(.028)	.56(.032)	.54(.033)
	75%	.67(.027)	.67(.031)	.66(.031)	.65(.032)	.65(.031)
	100%	.68(.027)	.68(.030)	.68(.030)	.68(.029)	.68(.029)
	Error	.38(.005)	.11(.003)	**.03(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.001)	.66(.001)
32	Total	.65(.015)	.61(.016)	.58(.015)	.56(.014)	.54(.015)
	25%	.55(.033)	.43(.030)	.36(.034)	.27(.030)	.22(.027)
	50%	.65(.030)	.61(.029)	.59(.031)	.56(.033)	.54(.033)
	75%	.69(.029)	.69(.030)	.68(.030)	.68(.030)	.68(.030)
	100%	.71(.026)	.70(.029)	.70(.028)	.71(.027)	.71(.031)
	Error	.34(.005)	.09(.003)	**.02(.002)**	**.00(.000)**	**.00(.000)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.52(.001)	.65(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 11.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .2 and dependence of 0.5.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.64(.016)	.62(.015)	.60(.016)	.58(.015)	.57(.016)
	25%	.58(.031)	.51(.033)	.46(.033)	.41(.030)	.36(.032)
	50%	.64(.031)	.61(.032)	.60(.032)	.58(.034)	.56(.032)
	75%	.67(.029)	.67(.029)	.67(.033)	.66(.031)	.66(.029)
	100%	.68(.030)	.68(.030)	.68(.030)	.68(.031)	.68(.029)
	Error	.49(.005)	.32(.005)	.23(.004)	.12(.003)	**.04(.002)**
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.17(.004)	.30(.003)	.39(.003)	.50(.003)	.63(.002)
16	Total	.73(.014)	.68(.014)	.65(.014)	.63(.014)	.60(.014)
	25%	.65(.032)	.53(.030)	.45(.033)	.38(.030)	.31(.029)
	50%	.73(.028)	.68(.030)	.65(.029)	.63(.028)	.60(.032)
	75%	.76(.025)	.75(.024)	.74(.027)	.74(.026)	.74(.027)
	100%	.77(.025)	.77(.029)	.77(.028)	.77(.028)	.77(.027)
	Error	.53(.005)	.28(.005)	.13(.003)	**.04(.002)**	**.00(.001)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	.78(.014)	.72(.013)	.69(.014)	.66(.014)	.63(.014)
	25%	.70(.030)	.55(.030)	.45(.031)	.36(.032)	.27(.028)
	50%	.78(.027)	.72(.029)	.69(.029)	.67(.031)	.63(.032)
	75%	**.81(.026)**	**.80(.027)**	**.80(.027)**	.79(.026)	.79(.027)
	100%	**.83(.025)**	**.83(.023)**	**.83(.025)**	**.83(.023)**	**.83(.025)**
	Error	.56(.005)	.23(.004)	.08(.003)	**.02(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.31(.002)	.41(.002)	.52(.002)	.66(.001)
32	Total	**.81(.012)**	.76(.013)	.72(.013)	.68(.014)	.65(.013)
	25%	.72(.027)	.57(.033)	.46(.032)	.33(.031)	.25(.028)
	50%	**.81(.026)**	.77(.025)	.73(.028)	.69(.030)	.65(.031)
	75%	**.85(.022)**	**.84(.023)**	**.84(.022)**	**.83(.024)**	**.82(.023)**
	100%	**.86(.021)**	**.86(.021)**	**.87(.022)**	**.87(.020)**	**.86(.020)**
	Error	.55(.005)	.22(.005)	.07(.003)	**.01(.001)**	**.00(.000)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.53(.001)	.65(.001)
		Random Uniform Responding				
8	Total	.65(.015)	.64(.014)	.63(.015)	.61(.014)	.60(.014)
	25%	.60(.032)	.55(.029)	.52(.030)	.47(.032)	.43(.032)
	50%	.66(.031)	.64(.029)	.63(.032)	.62(.030)	.60(.032)
	75%	.68(.028)	.67(.031)	.67(.030)	.67(.028)	.67(.031)

	100%	.68(.030)	.68(.031)	.69(.030)	.68(.030)	.68(.028)
	Error	.49(.005)	.32(.005)	.23(.004)	.12(.003)	**.04(.002)**
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.16(.004)	.30(.003)	.38(.003)	.50(.003)	.63(.002)
16	Total	.74(.015)	.71(.014)	.69(.014)	.67(.016)	.65(.015)
	25%	.68(.029)	.59(.031)	.53(.031)	.47(.031)	.42(.034)
	50%	.74(.028)	.71(.031)	.70(.028)	.68(.030)	.67(.030)
	75%	.77(.028)	.76(.027)	.76(.027)	.76(.028)	.75(.025)
	100%	.78(.027)	.77(.027)	.77(.027)	.77(.025)	.77(.029)
	Error	.53(.005)	.28(.005)	.13(.003)	**.04(.002)**	**.00(.001)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	.79(.012)	.75(.013)	.73(.014)	.71(.013)	.69(.014)
	25%	.72(.030)	.62(.030)	.54(.031)	.47(.031)	.41(.032)
	50%	.79(.027)	.76(.026)	.74(.027)	.73(.029)	.71(.032)
	75%	**.82(.025)**	**.82(.024)**	**.81(.025)**	**.80(.025)**	**.81(.026)**
	100%	**.83(.023)**	**.83(.024)**	**.83(.024)**	**.83(.024)**	**.83(.024)**
	Error	.56(.005)	.23(.004)	.08(.003)	**.02(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.001)	.66(.001)
32	Total	**.82(.011)**	.79(.013)	.77(.013)	.74(.012)	.71(.013)
	25%	.75(.026)	.64(.030)	.57(.035)	.47(.031)	.40(.029)
	50%	**.83(.024)**	**.80(.024)**	.78(.027)	.76(.025)	.74(.028)
	75%	**.85(.021)**	**.85(.023)**	**.85(.023)**	**.85(.021)**	**.84(.022)**
	100%	**.86(.020)**	**.86(.022)**	**.86(.022)**	**.87(.021)**	**.86(.021)**
	Error	.55(.005)	.22(.005)	.07(.003)	**.01(.001)**	**.00(.000)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.52(.001)	.65(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 12.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .3 and dependence of 0.5.

Pairs	Severity	0.2	0.4	0.5	0.6	0.7
		Random Normal Responding				
8	Total	.73(.014)	.71(.014)	.69(.014)	.67(.015)	.65(.015)
	25%	.68(.029)	.61(.031)	.56(.031)	.51(.031)	.45(.032)
	50%	.73(.029)	.70(.030)	.69(.030)	.67(.031)	.65(.030)
	75%	.76(.026)	.75(.026)	.75(.029)	.75(.028)	.74(.025)
	100%	.76(.025)	.76(.027)	.76(.026)	.76(.028)	.77(.026)
	Error	.59(.005)	.42(.005)	.31(.005)	.18(.004)	.06(.003)
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.17(.004)	.30(.003)	.39(.003)	.50(.003)	.63(.002)
16	Total	**.84(.012)**	**.80(.012)**	.78(.012)	.75(.013)	.72(.013)
	25%	.78(.029)	.68(.029)	.60(.031)	.52(.033)	.44(.029)
	50%	**.84(.023)**	**.80(.026)**	.78(.027)	.76(.026)	.73(.030)
	75%	**.86(.021)**	**.85(.019)**	**.85(.022)**	**.85(.022)**	**.84(.022)**
	100%	**.87(.021)**	**.87(.023)**	**.87(.023)**	**.87(.022)**	**.87(.021)**
	Error	.68(.005)	.42(.005)	.22(.004)	.09(.003)	**.01(.001)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	**.89(.010)**	**.86(.010)**	**.83(.012)**	**.80(.012)**	.76(.012)
	25%	**.85(.023)**	.73(.026)	.64(.032)	.54(.028)	.44(.029)
	50%	**.90(.020)**	**.86(.024)**	**.84(.023)**	**.82(.025)**	.79(.028)
	75%	**.92(.016)**	**.91(.019)**	**.91(.018)**	**.90(.018)**	**.90(.017)**
	100%	**.92(.018)**	**.92(.016)**	**.93(.017)**	**.92(.017)**	**.92(.017)**
	Error	.74(.004)	.40(.005)	.19(.004)	.05(.002)	**.00(.001)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.31(.002)	.41(.002)	.52(.002)	.66(.001)
32	Total	**.93(.008)**	**.89(.010)**	**.86(.010)**	**.82(.011)**	.79(.011)
	25%	**.88(.021)**	.77(.028)	.68(.029)	.55(.033)	.44(.030)
	50%	**.93(.018)**	**.90(.018)**	**.88(.021)**	**.85(.022)**	**.82(.026)**
	75%	**.95(.015)**	**.94(.014)**	**.94(.014)**	**.94(.016)**	**.93(.016)**
	100%	**.95(.013)**	**.95(.014)**	**.95(.013)**	**.95(.013)**	**.95(.014)**
	Error	.76(.004)	.42(.006)	.17(.004)	**.03(.002)**	**.00(.000)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.53(.001)	.65(.001)
		Random Uniform Responding				
8	Total	.74(.014)	.72(.014)	.71(.014)	.70(.014)	.68(.014)
	25%	.69(.029)	.64(.030)	.61(.031)	.57(.032)	.53(.031)
	50%	.74(.028)	.73(.028)	.72(.028)	.71(.029)	.69(.030)
	75%	.76(.026)	.76(.028)	.76(.027)	.76(.026)	.75(.027)

	100%	.76(.028)	.77(.029)	.77(.026)	.76(.027)	.76(.025)
	Error	.59(.005)	.42(.005)	.31(.005)	.18(.004)	.06(.003)
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.16(.004)	.30(.003)	.38(.003)	.50(.003)	.63(.002)
16	Total	**.85(.011)**	**.82(.012)**	**.81(.012)**	.79(.012)	.77(.013)
	25%	**.80(.023)**	.73(.030)	.67(.030)	.62(.028)	.57(.034)
	50%	**.85(.022)**	**.83(.025)**	**.82(.024)**	**.80(.025)**	.79(.025)
	75%	**.87(.022)**	**.86(.021)**	**.86(.022)**	**.86(.022)**	**.86(.023)**
	100%	**.87(.020)**	**.87(.022)**	**.87(.021)**	**.87(.022)**	**.87(.022)**
	Error	.68(.005)	.42(.005)	.22(.004)	.09(.003)	**.01(.001)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	**.90(.010)**	**.88(.010)**	**.86(.010)**	**.84(.011)**	**.82(.011)**
	25%	**.86(.022)**	.78(.025)	.72(.028)	.66(.029)	.58(.032)
	50%	**.90(.020)**	**.88(.020)**	**.87(.020)**	**.86(.022)**	**.85(.024)**
	75%	**.92(.018)**	**.92(.018)**	**.91(.019)**	**.91(.019)**	**.91(.016)**
	100%	**.92(.016)**	**.92(.016)**	**.93(.017)**	**.92(.017)**	**.92(.017)**
	Error	.74(.004)	.40(.005)	.19(.004)	.05(.002)	**.00(.001)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.001)	.66(.001)
32	Total	**.93(.008)**	**.91(.009)**	**.89(.009)**	**.87(.010)**	**.85(.010)**
	25%	**.89(.019)**	**.83(.024)**	.77(.027)	.68(.030)	.61(.030)
	50%	**.94(.015)**	**.92(.016)**	**.91(.019)**	**.89(.019)**	**.88(.020)**
	75%	**.95(.014)**	**.95(.015)**	**.95(.014)**	**.94(.015)**	**.94(.014)**
	100%	**.95(.013)**	**.95(.014)**	**.95(.014)**	**.95(.014)**	**.95(.014)**
	Error	.76(.004)	.42(.006)	.17(.004)	**.03(.002)**	**.00(.000)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.52(.001)	.65(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 13.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .4 and dependence of 0.5.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	**.81(.012)**	.79(.013)	.77(.013)	.76(.013)	.74(.014)
	25%	.77(.026)	.70(.029)	.66(.030)	.61(.031)	.55(.031)
	50%	**.81(.025)**	.79(.027)	.77(.027)	.76(.027)	.74(.028)
	75%	**.83(.023)**	**.83(.023)**	**.82(.026)**	**.82(.025)**	**.82(.022)**
	100%	**.84(.022)**	**.84(.024)**	**.83(.023)**	**.84(.024)**	**.84(.023)**
	Error	.69(.005)	.53(.005)	.41(.005)	.26(.004)	.11(.003)
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.17(.004)	.30(.003)	.39(.003)	.50(.003)	.63(.002)
16	Total	**.92(.009)**	**.89(.010)**	**.87(.010)**	**.85(.011)**	**.82(.011)**
	25%	**.88(.022)**	**.81(.025)**	.74(.028)	.68(.030)	.59(.030)
	50%	**.92(.018)**	**.90(.020)**	**.88(.019)**	**.87(.022)**	**.85(.023)**
	75%	**.93(.015)**	**.93(.016)**	**.93(.017)**	**.92(.016)**	**.92(.017)**
	100%	**.94(.016)**	**.94(.016)**	**.94(.016)**	**.94(.016)**	**.94(.014)**
	Error	.81(.004)	.59(.005)	.37(.005)	.17(.004)	**.03(.002)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	**.96(.006)**	**.94(.008)**	**.92(.008)**	**.90(.009)**	**.86(.010)**
	25%	**.94(.014)**	**.87(.021)**	**.81(.024)**	.72(.028)	.62(.030)
	50%	**.96(.013)**	**.94(.015)**	**.93(.016)**	**.92(.018)**	**.90(.020)**
	75%	**.97(.010)**	**.97(.012)**	**.97(.011)**	**.96(.011)**	**.96(.012)**
	100%	**.97(.011)**	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.010)**
	Error	.88(.004)	.61(.005)	.36(.005)	.13(.004)	**.01(.001)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.31(.002)	.41(.002)	.52(.002)	.66(.001)
32	Total	**.98(.005)**	**.96(.006)**	**.95(.007)**	**.92(.008)**	**.89(.009)**
	25%	**.96(.012)**	**.91(.019)**	**.85(.023)**	.75(.029)	.65(.030)
	50%	**.98(.009)**	**.97(.010)**	**.96(.011)**	**.95(.013)**	**.93(.017)**
	75%	**.99(.008)**	**.99(.007)**	**.98(.007)**	**.98(.008)**	**.98(.009)**
	100%	**.99(.006)**	**.99(.006)**	**.99(.006)**	**.99(.007)**	**.99(.007)**
	Error	.91(.003)	.66(.005)	.38(.005)	.09(.003)	**.00(.001)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.53(.001)	.65(.001)
		Random Uniform Responding				
8	Total	**.82(.012)**	**.80(.012)**	.79(.013)	.78(.012)	.76(.012)
	25%	.78(.028)	.73(.027)	.71(.030)	.66(.030)	.62(.030)
	50%	**.82(.025)**	**.80(.025)**	**.80(.025)**	.79(.026)	.78(.026)
	75%	**.84(.022)**	**.83(.025)**	**.83(.023)**	**.83(.022)**	**.82(.023)**

	100%	**.84(.024)**	**.84(.024)**	**.84(.023)**	**.83(.023)**	**.84(.022)**
	Error	.69(.005)	.53(.005)	.41(.005)	.26(.004)	.11(.003)
	Pre	.18(.004)	.33(.003)	.42(.003)	.54(.003)	.69(.002)
	Post	.16(.004)	.30(.003)	.38(.003)	.50(.003)	.63(.002)
16	Total	**.92(.008)**	**.91(.009)**	**.89(.009)**	**.88(.010)**	**.86(.011)**
	25%	**.90(.018)**	**.84(.023)**	**.80(.025)**	.76(.026)	.71(.029)
	50%	**.92(.017)**	**.91(.017)**	**.90(.020)**	**.89(.018)**	**.89(.020)**
	75%	**.93(.015)**	**.93(.015)**	**.93(.016)**	**.93(.017)**	**.93(.016)**
	100%	**.94(.015)**	**.94(.015)**	**.94(.015)**	**.94(.015)**	**.94(.016)**
	Error	.81(.004)	.59(.005)	.37(.005)	.17(.004)	**.03(.002)**
	Pre	.17(.002)	.33(.002)	.45(.002)	.57(.002)	.71(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.002)	.65(.002)
24	Total	**.96(.006)**	**.95(.006)**	**.94(.008)**	**.92(.008)**	**.91(.008)**
	25%	**.94(.014)**	**.90(.018)**	**.86(.021)**	**.81(.024)**	.75(.027)
	50%	**.96(.011)**	**.96(.013)**	**.95(.013)**	**.94(.014)**	**.93(.016)**
	75%	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.011)**	**.97(.011)**
	100%	**.97(.010)**	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.010)**
	Error	.88(.004)	.61(.005)	.36(.005)	.13(.004)	**.01(.001)**
	Pre	.16(.002)	.33(.002)	.45(.002)	.57(.001)	.72(.001)
	Post	.15(.002)	.30(.002)	.41(.002)	.52(.001)	.66(.001)
32	Total	**.98(.004)**	**.97(.006)**	**.96(.006)**	**.95(.007)**	**.93(.007)**
	25%	**.97(.011)**	**.94(.015)**	**.90(.018)**	**.85(.021)**	.79(.026)
	50%	**.98(.008)**	**.98(.009)**	**.97(.010)**	**.97(.011)**	**.96(.011)**
	75%	**.99(.007)**	**.99(.009)**	**.99(.007)**	**.99(.007)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.91(.003)	.66(.005)	.38(.005)	.09(.003)	**.00(.001)**
	Pre	.17(.002)	.32(.002)	.44(.001)	.57(.001)	.71(.001)
	Post	.16(.002)	.30(.002)	.40(.001)	.52(.001)	.65(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 14.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .1 and dependence of 0.75.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.57(.016)	.55(.016)	.54(.015)	.53(.016)	.51(.015)
	25%	.52(.032)	.48(.032)	.45(.030)	.42(.031)	.38(.029)
	50%	.56(.034)	.55(.034)	.54(.032)	.53(.032)	.52(.032)
	75%	.59(.032)	.58(.030)	.58(.032)	.58(.034)	.58(.031)
	100%	.59(.030)	.59(.031)	.59(.028)	.59(.031)	.59(.028)
	Error	.46(.005)	.36(.005)	.29(.004)	.19(.004)	.08(.003)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.004)	.27(.003)	.37(.003)	.52(.003)
16	Total	.61(.014)	.58(.016)	.57(.015)	.55(.016)	.53(.016)
	25%	.54(.030)	.48(.033)	.44(.031)	.39(.029)	.33(.030)
	50%	.60(.032)	.58(.031)	.57(.033)	.55(.030)	.53(.030)
	75%	.63(.028)	.63(.030)	.63(.032)	.63(.032)	.62(.033)
	100%	.64(.029)	.64(.029)	.65(.028)	.64(.031)	.64(.031)
	Error	.45(.005)	.30(.005)	.20(.004)	.09(.003)	**.02(.001)**
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	.64(.015)	.60(.016)	.59(.016)	.57(.016)	.54(.016)
	25%	.57(.032)	.47(.032)	.42(.031)	.37(.029)	.29(.029)
	50%	.64(.027)	.60(.033)	.58(.031)	.57(.031)	.54(.034)
	75%	.67(.032)	.66(.032)	.66(.031)	.65(.029)	.65(.030)
	100%	.68(.030)	.68(.030)	.68(.030)	.68(.032)	.68(.029)
	Error	.46(.005)	.24(.005)	.14(.004)	.05(.002)	**.00(.001)**
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.38(.002)	.54(.002)
32	Total	.66(.014)	.63(.014)	.60(.015)	.58(.014)	.56(.014)
	25%	.59(.031)	.49(.028)	.42(.031)	.35(.030)	.29(.030)
	50%	.66(.030)	.63(.029)	.60(.032)	.58(.031)	.56(.031)
	75%	.70(.030)	.69(.029)	.69(.029)	.68(.028)	.68(.031)
	100%	.71(.029)	.71(.028)	.71(.030)	.70(.028)	.71(.028)
	Error	.48(.005)	.25(.005)	.11(.003)	**.03(.002)**	**.00(.001)**
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.29(.002)	.38(.002)	.51(.001)
		Random Uniform Responding				
8	Total	.57(.017)	.56(.015)	.56(.015)	.55(.016)	.54(.017)
	25%	.54(.035)	.51(.032)	.49(.032)	.46(.031)	.43(.033)
	50%	.58(.035)	.57(.032)	.56(.032)	.55(.032)	.55(.032)
	75%	.59(.033)	.59(.032)	.59(.028)	.59(.031)	.58(.030)

	100%	.59(.032)	.59(.032)	.59(.032)	.59(.033)	.59(.029)
	Error	.46(.005)	.36(.005)	.29(.004)	.19(.004)	.08(.003)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.003)	.27(.003)	.37(.003)	.51(.003)
16	Total	.62(.016)	.60(.016)	.59(.014)	.58(.015)	.57(.017)
	25%	.57(.031)	.52(.031)	.49(.032)	.46(.031)	.41(.032)
	50%	.62(.030)	.60(.034)	.60(.030)	.59(.029)	.58(.030)
	75%	.64(.029)	.64(.029)	.64(.032)	.63(.029)	.63(.031)
	100%	.65(.033)	.64(.034)	.65(.030)	.64(.031)	.64(.030)
	Error	.45(.005)	.30(.005)	.20(.004)	.09(.003)	**.02(.001)**
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	.65(.016)	.63(.014)	.61(.016)	.60(.014)	.58(.016)
	25%	.59(.030)	.52(.031)	.49(.033)	.45(.031)	.39(.032)
	50%	.65(.031)	.63(.027)	.62(.033)	.61(.033)	.59(.028)
	75%	.68(.031)	.67(.030)	.67(.032)	.66(.029)	.66(.027)
	100%	.68(.028)	.68(.029)	.68(.028)	.68(.030)	.68(.029)
	Error	.46(.005)	.24(.005)	.14(.004)	.05(.002)	**.00(.001)**
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.37(.002)	.53(.002)
32	Total	.68(.016)	.65(.015)	.63(.014)	.62(.016)	.60(.015)
	25%	.62(.033)	.54(.031)	.49(.031)	.45(.030)	.39(.030)
	50%	.67(.031)	.65(.030)	.64(.029)	.63(.031)	.62(.031)
	75%	.70(.027)	.69(.031)	.70(.028)	.69(.033)	.69(.028)
	100%	.71(.030)	.70(.030)	.71(.028)	.71(.029)	.70(.030)
	Error	.48(.005)	.25(.005)	.11(.003)	**.03(.002)**	**.00(.001)**
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.28(.002)	.38(.002)	.51(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 15.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .2 and dependence of 0.75.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.66(.015)	.64(.015)	.63(.015)	.62(.016)	.60(.015)
	25%	.61(.031)	.57(.032)	.54(.031)	.50(.031)	.46(.030)
	50%	.66(.031)	.64(.030)	.63(.029)	.62(.030)	.61(.032)
	75%	.68(.028)	.67(.028)	.67(.031)	.67(.032)	.66(.030)
	100%	.68(.028)	.68(.028)	.68(.028)	.68(.028)	.68(.028)
	Error	.55(.005)	.45(.005)	.36(.005)	.24(.004)	.11(.003)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.004)	.27(.003)	.37(.003)	.52(.003)
16	Total	.74(.013)	.72(.014)	.71(.014)	.69(.014)	.66(.015)
	25%	.69(.029)	.63(.031)	.59(.031)	.53(.030)	.46(.032)
	50%	.74(.028)	.72(.028)	.71(.031)	.69(.028)	.67(.028)
	75%	.77(.026)	.76(.027)	.76(.027)	.76(.027)	.75(.029)
	100%	.77(.026)	.77(.025)	.77(.026)	.77(.027)	.77(.028)
	Error	.60(.005)	.44(.005)	.32(.005)	.17(.004)	**.04(.002)**
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	.79(.013)	.76(.014)	.75(.014)	.73(.013)	.70(.014)
	25%	.74(.027)	.65(.030)	.60(.032)	.55(.030)	.45(.032)
	50%	.79(.025)	.76(.027)	.75(.027)	.74(.026)	.71(.030)
	75%	**.82(.026)**	**.81(.025)**	**.81(.025)**	**.81(.024)**	**.80(.025)**
	100%	**.83(.022)**	**.83(.025)**	**.82(.024)**	**.82(.024)**	**.82(.024)**
	Error	.64(.005)	.41(.005)	.27(.005)	.12(.003)	**.01(.001)**
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.38(.002)	.54(.002)
32	Total	**.83(.011)**	**.81(.012)**	.78(.012)	.76(.013)	.73(.013)
	25%	.78(.026)	.70(.027)	.63(.031)	.56(.031)	.48(.032)
	50%	**.83(.023)**	**.81(.024)**	.79(.026)	.77(.026)	.75(.026)
	75%	**.86(.022)**	**.85(.020)**	**.85(.023)**	**.84(.023)**	**.84(.023)**
	100%	**.87(.022)**	**.86(.021)**	**.86(.022)**	**.86(.022)**	**.86(.021)**
	Error	.69(.005)	.45(.005)	.24(.004)	.08(.003)	**.01(.001)**
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.29(.002)	.38(.002)	.51(.001)
		Random Uniform Responding				
8	Total	.67(.016)	.65(.014)	.65(.015)	.64(.015)	.63(.016)
	25%	.63(.034)	.60(.031)	.58(.030)	.55(.031)	.52(.032)
	50%	.67(.032)	.66(.028)	.65(.031)	.64(.033)	.64(.032)
	75%	.68(.032)	.68(.028)	.68(.029)	.68(.028)	.68(.029)

	100%	.68(.030)	.68(.032)	.68(.033)	.68(.030)	.68(.029)
	Error	.55(.005)	.45(.005)	.36(.005)	.24(.004)	.11(.003)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.003)	.27(.003)	.37(.003)	.51(.003)
16	Total	.75(.014)	.73(.015)	.73(.014)	.71(.015)	.70(.015)
	25%	.70(.028)	.66(.029)	.63(.030)	.60(.031)	.55(.032)
	50%	.75(.027)	.74(.030)	.73(.028)	.73(.027)	.71(.029)
	75%	.77(.027)	.76(.029)	.76(.027)	.76(.027)	.76(.026)
	100%	.77(.027)	.77(.028)	.77(.026)	.77(.027)	.77(.026)
	Error	.60(.005)	.44(.005)	.32(.005)	.17(.004)	**.04(.002)**
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.80(.014)**	.78(.013)	.77(.013)	.76(.013)	.74(.015)
	25%	.76(.028)	.70(.028)	.66(.032)	.63(.031)	.57(.032)
	50%	**.80(.025)**	.79(.025)	.78(.027)	.77(.026)	.75(.027)
	75%	**.82(.026)**	**.82(.025)**	**.82(.024)**	**.81(.024)**	**.82(.024)**
	100%	**.83(.023)**	**.83(.023)**	**.82(.023)**	**.82(.025)**	**.83(.023)**
	Error	.64(.005)	.41(.005)	.27(.005)	.12(.003)	**.01(.001)**
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.37(.002)	.53(.002)
32	Total	**.84(.012)**	**.82(.011)**	**.81(.012)**	.79(.013)	.78(.012)
	25%	**.80(.026)**	.74(.025)	.69(.031)	.65(.032)	.60(.031)
	50%	**.84(.021)**	**.83(.023)**	**.82(.025)**	**.81(.025)**	**.80(.023)**
	75%	**.86(.022)**	**.86(.023)**	**.86(.023)**	**.85(.022)**	**.85(.021)**
	100%	**.86(.021)**	**.86(.023)**	**.86(.021)**	**.87(.022)**	**.86(.022)**
	Error	.69(.005)	.45(.005)	.24(.004)	.08(.003)	**.01(.001)**
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.28(.002)	.38(.002)	.51(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 16.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .3 and dependence of 0.75.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.74(.014)	.73(.015)	.72(.014)	.71(.014)	.69(.015)
	25%	.71(.027)	.67(.032)	.64(.031)	.60(.030)	.55(.033)
	50%	.74(.031)	.73(.029)	.72(.027)	.71(.028)	.69(.031)
	75%	.76(.027)	.76(.026)	.75(.027)	.75(.030)	.75(.027)
	100%	.76(.025)	.76(.027)	.77(.025)	.76(.027)	.76(.029)
	Error	.65(.005)	.55(.005)	.46(.005)	.33(.005)	.17(.004)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.004)	.27(.003)	.37(.003)	.52(.003)
16	Total	**.85(.011)**	**.83(.012)**	**.82(.013)**	**.80(.012)**	.78(.012)
	25%	**.81(.024)**	.76(.028)	.73(.027)	.68(.029)	.60(.029)
	50%	**.85(.025)**	**.83(.023)**	**.82(.027)**	**.81(.024)**	.79(.024)
	75%	**.87(.022)**	**.86(.021)**	**.86(.021)**	**.86(.021)**	**.85(.023)**
	100%	**.87(.021)**	**.87(.021)**	**.87(.021)**	**.87(.021)**	**.87(.021)**
	Error	.74(.005)	.59(.005)	.47(.006)	.29(.005)	.09(.003)
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.90(.009)**	**.88(.010)**	**.87(.010)**	**.86(.011)**	**.83(.011)**
	25%	**.87(.022)**	**.81(.025)**	.77(.027)	.72(.027)	.63(.031)
	50%	**.90(.018)**	**.89(.020)**	**.88(.020)**	**.87(.020)**	**.85(.023)**
	75%	**.92(.018)**	**.92(.017)**	**.91(.018)**	**.91(.018)**	**.91(.019)**
	100%	**.92(.015)**	**.92(.017)**	**.92(.017)**	**.92(.017)**	**.92(.017)**
	Error	.81(.004)	.60(.005)	.45(.006)	.25(.004)	**.04(.002)**
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.38(.002)	.54(.002)
32	Total	**.94(.008)**	**.92(.007)**	**.91(.009)**	**.89(.010)**	**.87(.010)**
	25%	**.91(.018)**	**.86(.020)**	**.81(.025)**	.75(.027)	.68(.031)
	50%	**.94(.016)**	**.93(.015)**	**.91(.018)**	**.90(.018)**	**.89(.018)**
	75%	**.95(.014)**	**.95(.014)**	**.94(.015)**	**.94(.016)**	**.94(.014)**
	100%	**.95(.013)**	**.95(.013)**	**.95(.014)**	**.95(.014)**	**.95(.014)**
	Error	.86(.004)	.68(.005)	.45(.005)	.21(.004)	**.04(.002)**
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.29(.002)	.38(.002)	.51(.001)
		Random Uniform Responding				
8	Total	.75(.015)	.74(.013)	.73(.014)	.73(.014)	.72(.015)
	25%	.72(.032)	.69(.029)	.68(.030)	.65(.031)	.61(.033)
	50%	.75(.028)	.74(.025)	.74(.029)	.73(.030)	.73(.028)
	75%	.76(.027)	.76(.026)	.76(.027)	.76(.027)	.76(.026)

	100%	.77(.027)	.77(.029)	.77(.029)	.77(.026)	.77(.027)
	Error	.65(.005)	.55(.005)	.46(.005)	.33(.005)	.17(.004)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.003)	.27(.003)	.37(.003)	.51(.003)
	Total	**.85(.012)**	**.84(.012)**	**.84(.012)**	**.83(.012)**	**.81(.012)**
	25%	**.82(.023)**	.79(.027)	.76(.026)	.74(.028)	.69(.029)
	50%	**.85(.023)**	**.85(.024)**	**.84(.024)**	**.83(.023)**	**.82(.025)**
16	75%	**.87(.023)**	**.87(.021)**	**.87(.021)**	**.86(.023)**	**.86(.023)**
	100%	**.87(.020)**	**.87(.023)**	**.87(.021)**	**.87(.021)**	**.87(.019)**
	Error	.74(.005)	.59(.005)	.47(.006)	.29(.005)	.09(.003)
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
	Total	**.91(.010)**	**.90(.009)**	**.89(.009)**	**.88(.010)**	**.86(.012)**
	25%	**.88(.019)**	**.84(.022)**	**.82(.025)**	.78(.026)	.73(.031)
	50%	**.91(.017)**	**.90(.018)**	**.90(.019)**	**.89(.019)**	**.88(.020)**
24	75%	**.92(.017)**	**.92(.017)**	**.92(.017)**	**.92(.017)**	**.92(.017)**
	100%	**.92(.017)**	**.92(.016)**	**.92(.017)**	**.92(.017)**	**.92(.017)**
	Error	.81(.004)	.60(.005)	.45(.006)	.25(.004)	**.04(.002)**
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.37(.002)	.53(.002)
	Total	**.94(.007)**	**.93(.007)**	**.92(.009)**	**.91(.009)**	**.90(.009)**
	25%	**.92(.016)**	**.89(.020)**	**.86(.023)**	**.82(.024)**	.78(.027)
	50%	**.94(.014)**	**.93(.015)**	**.93(.017)**	**.92(.017)**	**.92(.018)**
32	75%	**.95(.014)**	**.95(.014)**	**.95(.013)**	**.95(.014)**	**.95(.014)**
	100%	**.95(.014)**	**.95(.014)**	**.95(.013)**	**.95(.013)**	**.95(.015)**
	Error	.86(.004)	.68(.005)	.45(.005)	.21(.004)	**.04(.002)**
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.28(.002)	.38(.002)	.51(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 17.

Mean power, error, and mean Psychometric Synonym index in normally distributed data with an empirical cutoff of .4 and dependence of 0.75.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	**.82(.012)**	**.81(.013)**	**.80(.013)**	.79(.013)	.77(.013)
	25%	.79(.026)	.76(.028)	.73(.029)	.70(.028)	.65(.031)
	50%	**.82(.025)**	**.81(.025)**	**.80(.024)**	.79(.026)	.78(.029)
	75%	**.83(.023)**	**.83(.024)**	**.83(.024)**	**.83(.026)**	**.83(.025)**
	100%	**.83(.023)**	**.84(.022)**	**.84(.021)**	**.83(.023)**	**.84(.025)**
	Error	.74(.004)	.65(.005)	.57(.005)	.44(.005)	.24(.005)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.004)	.27(.003)	.37(.003)	.52(.003)
16	Total	**.92(.009)**	**.91(.009)**	**.91(.009)**	**.89(.010)**	**.87(.010)**
	25%	**.90(.019)**	**.87(.023)**	**.84(.023)**	**.80(.023)**	.74(.027)
	50%	**.92(.019)**	**.91(.017)**	**.91(.018)**	**.90(.021)**	**.89(.020)**
	75%	**.94(.016)**	**.93(.017)**	**.93(.017)**	**.93(.016)**	**.93(.016)**
	100%	**.94(.016)**	**.94(.015)**	**.94(.016)**	**.94(.016)**	**.94(.016)**
	Error	.85(.004)	.74(.005)	.64(.005)	.45(.005)	.17(.004)
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.97(.005)**	**.95(.006)**	**.95(.007)**	**.94(.007)**	**.92(.008)**
	25%	**.95(.013)**	**.92(.017)**	**.90(.020)**	**.86(.020)**	.79(.025)
	50%	**.97(.011)**	**.96(.013)**	**.95(.014)**	**.95(.015)**	**.93(.015)**
	75%	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.012)**
	100%	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.010)**	**.97(.010)**
	Error	.92(.003)	.78(.004)	.66(.005)	.44(.005)	.11(.003)
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.38(.002)	.54(.002)
32	Total	**.98(.004)**	**.98(.004)**	**.97(.006)**	**.96(.006)**	**.95(.008)**
	25%	**.98(.010)**	**.95(.012)**	**.93(.017)**	**.90(.019)**	**.85(.025)**
	50%	**.98(.008)**	**.98(.008)**	**.97(.010)**	**.97(.010)**	**.96(.011)**
	75%	**.99(.007)**	**.99(.007)**	**.99(.008)**	**.99(.008)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.006)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.95(.002)	.86(.004)	.69(.005)	.42(.005)	.12(.003)
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.29(.002)	.38(.002)	.51(.001)
		Random Uniform Responding				
8	Total	**.82(.013)**	**.82(.012)**	**.81(.012)**	**.80(.013)**	.79(.013)
	25%	**.80(.028)**	.78(.028)	.76(.026)	.73(.030)	.70(.029)
	50%	**.82(.025)**	**.82(.023)**	**.81(.026)**	**.80(.027)**	**.80(.024)**
	75%	**.84(.024)**	**.83(.022)**	**.83(.023)**	**.83(.023)**	**.83(.023)**

	100%	**.84(.022)**	**.84(.025)**	**.84(.025)**	**.84(.023)**	**.84(.023)**
	Error	.74(.004)	.65(.005)	.57(.005)	.44(.005)	.24(.005)
	Pre	.12(.004)	.22(.003)	.29(.003)	.41(.003)	.57(.003)
	Post	.11(.004)	.20(.003)	.27(.003)	.37(.003)	.51(.003)
16	Total	**.93(.009)**	**.92(.009)**	**.91(.009)**	**.91(.010)**	**.89(.010)**
	25%	**.91(.019)**	**.88(.019)**	**.87(.022)**	**.84(.024)**	**.80(.026)**
	50%	**.93(.016)**	**.92(.017)**	**.92(.017)**	**.91(.016)**	**.90(.018)**
	75%	**.94(.016)**	**.93(.016)**	**.94(.016)**	**.93(.015)**	**.93(.017)**
	100%	**.94(.015)**	**.94(.017)**	**.94(.015)**	**.94(.016)**	**.94(.015)**
	Error	.85(.004)	.74(.005)	.64(.005)	.45(.005)	.17(.004)
	Pre	.13(.003)	.22(.002)	.30(.002)	.41(.002)	.57(.002)
	Post	.12(.002)	.21(.002)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.97(.006)**	**.96(.006)**	**.96(.007)**	**.95(.007)**	**.94(.008)**
	25%	**.96(.013)**	**.93(.016)**	**.92(.018)**	**.90(.019)**	**.86(.023)**
	50%	**.97(.011)**	**.96(.012)**	**.96(.012)**	**.96(.013)**	**.95(.013)**
	75%	**.97(.011)**	**.97(.011)**	**.97(.011)**	**.97(.011)**	**.97(.011)**
	100%	**.97(.010)**	**.97(.009)**	**.97(.010)**	**.97(.010)**	**.97(.010)**
	Error	.92(.003)	.78(.004)	.66(.005)	.44(.005)	.11(.003)
	Pre	.12(.002)	.24(.002)	.31(.002)	.41(.002)	.59(.002)
	Post	.11(.002)	.22(.002)	.28(.002)	.37(.002)	.53(.002)
32	Total	**.98(.004)**	**.98(.005)**	**.98(.005)**	**.97(.005)**	**.96(.006)**
	25%	**.98(.009)**	**.96(.011)**	**.95(.014)**	**.93(.015)**	**.91(.018)**
	50%	**.98(.007)**	**.98(.009)**	**.98(.008)**	**.98(.009)**	**.98(.010)**
	75%	**.99(.007)**	**.99(.008)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	100%	**.99(.007)**	**.99(.008)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.95(.002)	.86(.004)	.69(.005)	.42(.005)	.12(.003)
	Pre	.11(.002)	.22(.002)	.31(.002)	.42(.002)	.56(.001)
	Post	.10(.002)	.20(.002)	.28(.002)	.38(.002)	.51(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 18.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .1 and dependence of 0.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.55(.015)	.50(.014)	.48(.015)	.46(.014)	.44(.015)
	25%	.47(.030)	.35(.032)	.29(.027)	.23(.025)	.19(.027)
	50%	.54(.030)	.49(.029)	.46(.033)	.44(.032)	.41(.030)
	75%	.58(.031)	.57(.032)	.56(.034)	.56(.029)	.55(.036)
	100%	.59(.030)	.59(.030)	.59(.029)	.60(.029)	.59(.028)
	Error	.36(.005)	.15(.004)	.07(.003)	**.03(.002)**	**.01(.001)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.74(.002)
16	Total	.58(.015)	.51(.016)	.48(.015)	.45(.014)	.42(.016)
	25%	.47(.032)	.29(.029)	.21(.026)	.15(.023)	.10(.019)
	50%	.57(.034)	.49(.031)	.45(.032)	.41(.031)	.37(.031)
	75%	.62(.029)	.61(.031)	.60(.033)	.59(.031)	.58(.033)
	100%	.64(.030)	.64(.031)	.64(.030)	.64(.027)	.65(.030)
	Error	.30(.005)	.06(.002)	**.02(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.64(.002)	.75(.001)
24	Total	.59(.015)	.51(.014)	.47(.014)	.44(.013)	.42(.013)
	25%	.45(.031)	.24(.028)	.15(.025)	.10(.019)	.06(.016)
	50%	.58(.029)	.49(.033)	.44(.032)	.39(.030)	.34(.029)
	75%	.66(.031)	.63(.030)	.62(.031)	.61(.032)	.59(.030)
	100%	.68(.031)	.68(.028)	.68(.028)	.68(.029)	.68(.031)
	Error	.25(.005)	**.03(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.43(.002)	.54(.002)	.64(.001)	.75(.001)
32	Total	.61(.016)	.51(.013)	.47(.015)	.44(.014)	.42(.013)
	25%	.44(.033)	.21(.027)	.12(.020)	.07(.017)	.03(.011)
	50%	.60(.033)	.48(.030)	.42(.033)	.37(.033)	.32(.028)
	75%	.68(.028)	.65(.028)	.64(.031)	.62(.030)	.61(.030)
	100%	.71(.030)	.71(.028)	.71(.031)	.71(.029)	.70(.029)
	Error	.21(.004)	**.01(.001)**	**.00(.000)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)
		Random Uniform Responding				
8	Total	.56(.015)	.52(.015)	.50(.014)	.49(.016)	.47(.015)
	25%	.49(.031)	.39(.032)	.34(.029)	.29(.028)	.25(.027)
	50%	.56(.030)	.52(.032)	.50(.030)	.49(.033)	.47(.031)
	75%	.58(.030)	.57(.031)	.57(.030)	.57(.030)	.57(.032)

	100%	.59(.031)	.59(.032)	.59(.032)	.59(.031)	.60(.030)
	Error	.36(.005)	.15(.004)	.07(.003)	**.03(.002)**	**.01(.001)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.73(.002)
16	Total	.59(.014)	.54(.015)	.51(.014)	.49(.014)	.47(.014)
	25%	.50(.032)	.34(.032)	.28(.030)	.21(.026)	.17(.022)
	50%	.59(.033)	.54(.031)	.51(.032)	.49(.029)	.46(.030)
	75%	.63(.029)	.62(.029)	.61(.031)	.61(.034)	.61(.030)
	100%	.65(.031)	.64(.029)	.65(.030)	.64(.029)	.64(.030)
	Error	.30(.005)	.06(.002)	**.02(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.63(.002)	.74(.001)
24	Total	.61(.015)	.55(.015)	.52(.014)	.49(.014)	.47(.013)
	25%	.49(.028)	.31(.031)	.23(.026)	.16(.024)	.11(.020)
	50%	.61(.031)	.55(.031)	.51(.031)	.48(.031)	.44(.031)
	75%	.67(.030)	.65(.031)	.64(.030)	.64(.030)	.63(.028)
	100%	.68(.030)	.68(.029)	.68(.029)	.68(.028)	.68(.027)
	Error	.25(.005)	**.03(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.42(.002)	.53(.001)	.64(.001)	.75(.001)
32	Total	.63(.014)	.56(.016)	.52(.015)	.49(.014)	.47(.014)
	25%	.49(.032)	.28(.029)	.20(.024)	.13(.024)	.08(.017)
	50%	.63(.027)	.56(.032)	.51(.032)	.47(.031)	.43(.030)
	75%	.69(.028)	.67(.029)	.67(.029)	.66(.029)	.65(.029)
	100%	.71(.028)	.71(.030)	.71(.028)	.71(.029)	.71(.026)
	Error	.21(.004)	**.01(.001)**	**.00(.000)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 19.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .2 and dependence of 0.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.64(.015)	.59(.013)	.57(.015)	.54(.015)	.52(.015)
	25%	.57(.030)	.44(.032)	.37(.032)	.31(.029)	.26(.031)
	50%	.64(.030)	.58(.030)	.56(.033)	.53(.032)	.50(.031)
	75%	.67(.030)	.66(.030)	.65(.031)	.65(.029)	.65(.033)
	100%	.68(.029)	.68(.028)	.68(.028)	.68(.029)	.68(.028)
	Error	.45(.005)	.21(.004)	.11(.003)	**.04(.002)**	**.01(.001)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.74(.002)
16	Total	.71(.013)	.64(.015)	.61(.015)	.57(.014)	.54(.015)
	25%	.61(.029)	.42(.029)	.33(.030)	.24(.029)	.17(.024)
	50%	.71(.026)	.63(.030)	.60(.031)	.56(.032)	.51(.031)
	75%	.75(.027)	.74(.028)	.73(.029)	.73(.028)	.72(.029)
	100%	.77(.026)	.77(.026)	.77(.029)	.77(.027)	.77(.027)
	Error	.44(.005)	.12(.003)	**.04(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.64(.002)	.75(.001)
24	Total	.75(.014)	.67(.013)	.63(.014)	.59(.014)	.56(.012)
	25%	.63(.029)	.41(.031)	.29(.029)	.20(.026)	.13(.021)
	50%	.75(.028)	.67(.030)	.62(.030)	.57(.031)	.52(.030)
	75%	**.81(.027)**	.79(.025)	.78(.024)	.77(.027)	.76(.025)
	100%	**.83(.025)**	**.82(.025)**	**.82(.024)**	**.83(.026)**	**.83(.025)**
	Error	.41(.005)	.07(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.43(.002)	.54(.002)	.64(.001)	.75(.001)
32	Total	.79(.013)	.69(.013)	.65(.013)	.61(.013)	.57(.012)
	25%	.66(.033)	.40(.029)	.26(.027)	.17(.025)	.09(.018)
	50%	.79(.025)	.69(.028)	.64(.031)	.59(.031)	.52(.031)
	75%	**.85(.024)**	**.83(.024)**	**.82(.024)**	**.80(.024)**	**.80(.025)**
	100%	**.86(.022)**	**.86(.022)**	**.86(.020)**	**.86(.023)**	**.86(.022)**
	Error	.40(.006)	.05(.002)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)
		Random Uniform Responding				
8	Total	.65(.014)	.61(.015)	.59(.015)	.58(.016)	.56(.015)
	25%	.58(.031)	.49(.033)	.43(.031)	.38(.031)	.33(.029)
	50%	.65(.030)	.61(.032)	.60(.031)	.58(.032)	.56(.030)
	75%	.67(.028)	.67(.028)	.67(.030)	.67(.028)	.66(.033)

	100%	.68(.031)	.68(.029)	.68(.030)	.69(.030)	.69(.029)
	Error	.45(.005)	.21(.004)	.11(.003)	**.04(.002)**	**.01(.001)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.73(.002)
16	Total	.73(.014)	.67(.015)	.65(.015)	.62(.014)	.60(.014)
	25%	.64(.032)	.49(.032)	.42(.034)	.33(.029)	.27(.027)
	50%	.73(.029)	.68(.030)	.65(.031)	.63(.028)	.60(.030)
	75%	.76(.027)	.75(.027)	.74(.027)	.74(.030)	.74(.028)
	100%	.77(.028)	.77(.026)	.77(.028)	.77(.027)	.77(.024)
	Error	.44(.005)	.12(.003)	**.04(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.63(.002)	.74(.001)
24	Total	.77(.012)	.71(.013)	.68(.013)	.65(.013)	.62(.013)
	25%	.67(.028)	.49(.031)	.39(.032)	.31(.029)	.23(.027)
	50%	.78(.028)	.72(.028)	.69(.030)	.66(.030)	.62(.030)
	75%	**.82(.025)**	**.80(.026)**	**.80(.024)**	.79(.025)	.79(.025)
	100%	**.83(.023)**	**.82(.024)**	**.83(.023)**	**.83(.022)**	**.83(.023)**
	Error	.41(.005)	.07(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.42(.002)	.53(.001)	.64(.001)	.75(.001)
32	Total	**.81(.012)**	.74(.014)	.70(.013)	.66(.013)	.63(.012)
	25%	.70(.028)	.49(.033)	.38(.029)	.28(.029)	.19(.025)
	50%	**.81(.023)**	.76(.027)	.72(.030)	.68(.030)	.64(.029)
	75%	**.85(.022)**	**.84(.024)**	**.84(.023)**	**.83(.024)**	**.83(.022)**
	100%	**.87(.021)**	**.86(.022)**	**.86(.018)**	**.86(.021)**	**.87(.020)**
	Error	.40(.006)	.05(.002)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 20.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .3 and dependence of 0.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.73(.014)	.68(.012)	.66(.015)	.63(.014)	.61(.014)
	25%	.66(.030)	.54(.031)	.47(.031)	.40(.031)	.34(.033)
	50%	.72(.026)	.68(.029)	.65(.029)	.62(.031)	.60(.030)
	75%	.75(.028)	.74(.027)	.74(.029)	.74(.024)	.73(.029)
	100%	.76(.029)	.76(.025)	.76(.027)	.76(.027)	.76(.025)
	Error	.55(.005)	.29(.004)	.16(.004)	.07(.003)	**.02(.001)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.74(.002)
16	Total	**.83(.011)**	.77(.012)	.73(.013)	.70(.013)	.66(.014)
	25%	.75(.027)	.58(.029)	.48(.031)	.38(.031)	.28(.029)
	50%	**.83(.020)**	.77(.025)	.74(.025)	.70(.029)	.66(.030)
	75%	**.86(.023)**	**.85(.022)**	**.84(.023)**	**.84(.023)**	**.83(.025)**
	100%	**.87(.022)**	**.87(.021)**	**.87(.022)**	**.87(.022)**	**.87(.021)**
	Error	.59(.005)	.22(.004)	.09(.003)	**.02(.001)**	**.00(.000)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.64(.002)	.75(.001)
24	Total	**.88(.010)**	**.81(.012)**	.77(.012)	.73(.012)	.69(.012)
	25%	**.80(.024)**	.60(.032)	.47(.030)	.35(.032)	.25(.026)
	50%	**.88(.021)**	**.82(.025)**	.78(.026)	.74(.027)	.70(.028)
	75%	**.91(.018)**	**.90(.018)**	**.90(.019)**	**.89(.020)**	**.88(.019)**
	100%	**.92(.016)**	**.92(.017)**	**.92(.016)**	**.92(.018)**	**.92(.017)**
	Error	.61(.005)	.17(.004)	**.04(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.43(.002)	.54(.002)	.64(.001)	.75(.001)
32	Total	**.91(.009)**	**.84(.011)**	.79(.010)	.75(.011)	.70(.011)
	25%	**.84(.025)**	.62(.029)	.47(.030)	.34(.028)	.21(.028)
	50%	**.92(.016)**	**.86(.021)**	**.82(.024)**	.78(.025)	.73(.028)
	75%	**.94(.015)**	**.93(.016)**	**.93(.016)**	**.92(.018)**	**.92(.018)**
	100%	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.013)**
	Error	.63(.005)	.13(.003)	**.02(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)
		Random Uniform Responding				
8	Total	.73(.013)	.70(.014)	.68(.014)	.67(.014)	.65(.014)
	25%	.68(.029)	.58(.031)	.53(.032)	.47(.032)	.42(.030)
	50%	.74(.026)	.70(.029)	.69(.029)	.67(.029)	.65(.029)
	75%	.76(.027)	.75(.025)	.75(.028)	.75(.026)	.74(.029)

	100%	.76(.029)	.76(.025)	.77(.027)	.77(.028)	.77(.027)
	Error	.55(.005)	.29(.004)	.16(.004)	.07(.003)	**.02(.001)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.73(.002)
	Total	**.84(.011)**	.79(.013)	.77(.013)	.74(.014)	.72(.013)
	25%	.77(.024)	.64(.031)	.57(.032)	.48(.031)	.41(.032)
	50%	**.84(.023)**	**.80(.023)**	.78(.027)	.76(.026)	.74(.027)
16	75%	**.86(.023)**	**.86(.022)**	**.85(.022)**	**.85(.025)**	**.85(.022)**
	100%	**.87(.023)**	**.87(.020)**	**.87(.022)**	**.87(.022)**	**.87(.019)**
	Error	.59(.005)	.22(.004)	.09(.003)	**.02(.001)**	**.00(.000)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.63(.002)	.74(.001)
	Total	**.89(.010)**	**.84(.011)**	**.81(.011)**	.78(.012)	.75(.012)
	25%	**.82(.025)**	.68(.029)	.58(.029)	.49(.033)	.39(.033)
	50%	**.89(.020)**	**.86(.024)**	**.83(.025)**	**.81(.024)**	.79(.026)
24	75%	**.92(.018)**	**.91(.019)**	**.91(.019)**	**.90(.018)**	**.90(.019)**
	100%	**.92(.017)**	**.92(.017)**	**.92(.016)**	**.92(.017)**	**.92(.016)**
	Error	.61(.005)	.17(.004)	**.04(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.42(.002)	.53(.001)	.64(.001)	.75(.001)
	Total	**.92(.009)**	**.87(.010)**	**.84(.011)**	**.81(.010)**	.77(.011)
	25%	**.86(.022)**	.71(.029)	.59(.031)	.49(.032)	.37(.030)
	50%	**.93(.015)**	**.90(.020)**	**.87(.022)**	**.85(.022)**	**.82(.025)**
32	75%	**.95(.014)**	**.94(.015)**	**.94(.015)**	**.94(.015)**	**.93(.016)**
	100%	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.014)**
	Error	.63(.005)	.13(.003)	**.02(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 21.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .4 and dependence of 0.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	**.80(.013)**	.77(.012)	.74(.014)	.72(.014)	.69(.015)
	25%	.75(.028)	.65(.029)	.57(.033)	.51(.033)	.44(.035)
	50%	**.80(.023)**	.77(.027)	.74(.027)	.72(.031)	.69(.030)
	75%	**.83(.024)**	**.82(.024)**	**.82(.025)**	**.82(.022)**	**.81(.026)**
	100%	**.84(.024)**	**.83(.024)**	**.84(.024)**	**.84(.023)**	**.83(.024)**
	Error	.65(.005)	.39(.005)	.24(.004)	.11(.003)	**.03(.002)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.74(.002)
16	Total	**.91(.009)**	**.86(.010)**	**.84(.011)**	**.80(.011)**	.77(.013)
	25%	**.86(.023)**	.73(.025)	.64(.031)	.53(.029)	.43(.032)
	50%	**.91(.017)**	**.87(.021)**	**.85(.022)**	**.82(.023)**	.79(.027)
	75%	**.93(.017)**	**.92(.017)**	**.92(.017)**	**.92(.018)**	**.91(.020)**
	100%	**.94(.015)**	**.94(.016)**	**.94(.015)**	**.94(.015)**	**.94(.015)**
	Error	.74(.005)	.35(.004)	.17(.004)	**.04(.002)**	**.00(.001)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.64(.002)	.75(.001)
24	Total	**.95(.007)**	**.91(.009)**	**.88(.010)**	**.84(.010)**	**.80(.011)**
	25%	**.91(.017)**	.77(.027)	.67(.029)	.55(.031)	.43(.031)
	50%	**.95(.014)**	**.92(.018)**	**.90(.019)**	**.88(.021)**	**.84(.022)**
	75%	**.97(.010)**	**.96(.011)**	**.96(.013)**	**.96(.014)**	**.95(.013)**
	100%	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.010)**
	Error	.78(.004)	.33(.005)	.11(.004)	**.02(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.43(.002)	.54(.002)	.64(.001)	.75(.001)
32	Total	**.97(.005)**	**.93(.007)**	**.90(.008)**	**.86(.009)**	**.81(.010)**
	25%	**.94(.016)**	**.82(.024)**	.70(.030)	.57(.033)	.41(.032)
	50%	**.98(.010)**	**.95(.012)**	**.93(.015)**	**.91(.019)**	**.89(.019)**
	75%	**.98(.008)**	**.98(.008)**	**.98(.009)**	**.98(.009)**	**.98(.010)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.006)**	**.99(.007)**	**.99(.007)**
	Error	.82(.004)	.31(.005)	.08(.003)	**.01(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)
		Random Uniform Responding				
8	Total	**.81(.012)**	.78(.012)	.77(.012)	.75(.014)	.73(.013)
	25%	.76(.026)	.68(.028)	.63(.030)	.57(.032)	.52(.030)
	50%	**.81(.025)**	.78(.026)	.77(.028)	.76(.026)	.74(.028)
	75%	**.83(.023)**	**.83(.023)**	**.83(.024)**	**.83(.024)**	**.82(.024)**

	100%	**.84(.025)**	**.83(.023)**	**.84(.023)**	**.84(.024)**	**.84(.024)**
	Error	.65(.005)	.39(.005)	.24(.004)	.11(.003)	**.03(.002)**
	Pre	.22(.004)	.44(.003)	.56(.003)	.68(.002)	.80(.001)
	Post	.20(.004)	.40(.003)	.52(.003)	.62(.002)	.73(.002)
	Total	**.91(.009)**	**.88(.011)**	**.86(.011)**	**.84(.011)**	**.82(.011)**
	25%	**.87(.022)**	.78(.027)	.71(.030)	.64(.030)	.56(.031)
	50%	**.92(.018)**	**.89(.020)**	**.88(.020)**	**.87(.022)**	**.85(.022)**
16	75%	**.93(.016)**	**.93(.017)**	**.93(.017)**	**.93(.017)**	**.92(.018)**
	100%	**.94(.016)**	**.94(.015)**	**.94(.015)**	**.94(.014)**	**.94(.014)**
	Error	.74(.005)	.35(.004)	.17(.004)	**.04(.002)**	**.00(.001)**
	Pre	.23(.002)	.46(.002)	.57(.002)	.69(.001)	.81(.001)
	Post	.21(.002)	.42(.002)	.52(.002)	.63(.002)	.74(.001)
	Total	**.96(.006)**	**.93(.008)**	**.91(.009)**	**.88(.009)**	**.85(.010)**
	25%	**.92(.018)**	**.83(.022)**	.76(.026)	.68(.030)	.58(.032)
	50%	**.96(.012)**	**.94(.015)**	**.93(.016)**	**.92(.017)**	**.90(.018)**
24	75%	**.97(.011)**	**.97(.011)**	**.97(.012)**	**.96(.011)**	**.96(.011)**
	100%	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.010)**
	Error	.78(.004)	.33(.005)	.11(.004)	**.02(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.002)	.58(.001)	.70(.001)	.81(.001)
	Post	.22(.002)	.42(.002)	.53(.001)	.64(.001)	.75(.001)
	Total	**.98(.005)**	**.95(.007)**	**.93(.008)**	**.91(.008)**	**.87(.009)**
	25%	**.95(.014)**	**.87(.022)**	**.80(.026)**	.71(.028)	.59(.031)
	50%	**.98(.009)**	**.97(.011)**	**.96(.013)**	**.95(.015)**	**.93(.015)**
32	75%	**.99(.008)**	**.98(.008)**	**.98(.008)**	**.98(.007)**	**.98(.009)**
	100%	**.99(.006)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.82(.004)	.31(.005)	.08(.003)	**.01(.001)**	**.00(.000)**
	Pre	.24(.002)	.46(.001)	.58(.001)	.70(.001)	.83(.001)
	Post	.22(.002)	.43(.001)	.54(.001)	.64(.001)	.76(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 22.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .1 and dependence of 0.25.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.55(.017)	.51(.014)	.49(.016)	.48(.017)	.45(.014)
	25%	.49(.034)	.39(.029)	.33(.029)	.28(.029)	.23(.027)
	50%	.55(.032)	.51(.033)	.48(.035)	.46(.034)	.44(.034)
	75%	.59(.032)	.57(.030)	.57(.030)	.57(.030)	.55(.031)
	100%	.59(.031)	.59(.028)	.59(.030)	.60(.029)	.59(.030)
	Error	.39(.005)	.19(.004)	.10(.003)	.05(.002)	**.01(.001)**
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.004)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	.59(.016)	.53(.014)	.50(.015)	.47(.015)	.45(.015)
	25%	.49(.033)	.34(.029)	.27(.028)	.20(.025)	.16(.021)
	50%	.58(.032)	.51(.030)	.48(.031)	.45(.032)	.41(.032)
	75%	.63(.029)	.62(.028)	.60(.031)	.60(.032)	.59(.032)
	100%	.64(.030)	.64(.030)	.64(.029)	.65(.032)	.64(.030)
	Error	.34(.005)	.10(.003)	**.04(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.59(.002)	.70(.002)
24	Total	.61(.015)	.54(.014)	.50(.015)	.47(.014)	.45(.014)
	25%	.49(.032)	.30(.030)	.22(.024)	.15(.022)	.11(.020)
	50%	.60(.031)	.52(.030)	.48(.032)	.44(.032)	.40(.029)
	75%	.66(.031)	.64(.028)	.63(.032)	.62(.030)	.61(.030)
	100%	.68(.029)	.68(.027)	.68(.029)	.68(.030)	.68(.029)
	Error	.30(.005)	.05(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	.62(.015)	.54(.014)	.50(.014)	.47(.015)	.45(.014)
	25%	.48(.030)	.27(.028)	.18(.025)	.12(.022)	.08(.016)
	50%	.62(.030)	.52(.033)	.47(.029)	.43(.034)	.38(.033)
	75%	.69(.028)	.66(.030)	.65(.029)	.64(.030)	.63(.030)
	100%	.71(.030)	.71(.030)	.71(.029)	.71(.030)	.71(.028)
	Error	.26(.005)	**.03(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.49(.001)	.59(.001)	.70(.001)
		Random Uniform Responding				
8	Total	.56(.016)	.53(.015)	.52(.016)	.50(.016)	.49(.015)
	25%	.51(.033)	.42(.030)	.38(.034)	.33(.030)	.29(.028)
	50%	.56(.031)	.54(.032)	.52(.031)	.50(.031)	.49(.029)
	75%	.59(.030)	.58(.031)	.58(.031)	.57(.030)	.58(.032)

	100%	.59(.030)	.59(.032)	.59(.032)	.59(.032)	.59(.030)
	Error	.39(.005)	.19(.004)	.10(.003)	.05(.002)	**.01(.001)**
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.003)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	.60(.016)	.56(.015)	.53(.016)	.51(.014)	.49(.014)
	25%	.53(.028)	.40(.031)	.33(.029)	.28(.026)	.22(.025)
	50%	.60(.032)	.56(.031)	.53(.033)	.51(.032)	.48(.030)
	75%	.63(.031)	.63(.028)	.62(.031)	.62(.030)	.60(.031)
	100%	.65(.028)	.65(.030)	.64(.032)	.64(.030)	.64(.031)
	Error	.34(.005)	.10(.003)	**.04(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.58(.002)	.69(.001)
24	Total	.63(.015)	.57(.013)	.54(.015)	.52(.015)	.49(.015)
	25%	.52(.034)	.37(.030)	.30(.032)	.23(.026)	.18(.024)
	50%	.63(.030)	.57(.031)	.54(.033)	.51(.033)	.48(.032)
	75%	.67(.030)	.66(.028)	.65(.031)	.65(.031)	.64(.031)
	100%	.68(.027)	.68(.027)	.68(.029)	.68(.028)	.68(.027)
	Error	.30(.005)	.05(.003)	**.01(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.18(.002)	.37(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	.64(.014)	.58(.014)	.55(.015)	.52(.014)	.49(.013)
	25%	.52(.031)	.35(.030)	.26(.029)	.20(.025)	.14(.022)
	50%	.64(.029)	.58(.029)	.55(.031)	.52(.030)	.48(.029)
	75%	.69(.029)	.68(.031)	.68(.030)	.67(.028)	.65(.029)
	100%	.71(.030)	.71(.031)	.70(.031)	.71(.028)	.70(.026)
	Error	.26(.005)	**.03(.002)**	**.00(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.001)	.49(.001)	.59(.001)	.70(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 23.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .2 and dependence of 0.25.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.65(.016)	.61(.014)	.58(.016)	.57(.015)	.54(.015)
	25%	.59(.034)	.48(.031)	.42(.029)	.37(.032)	.30(.031)
	50%	.64(.031)	.60(.031)	.58(.033)	.55(.032)	.53(.032)
	75%	.67(.030)	.66(.029)	.66(.029)	.66(.029)	.65(.029)
	100%	.68(.029)	.68(.028)	.68(.030)	.68(.027)	.68(.029)
	Error	.49(.005)	.26(.004)	.15(.003)	.07(.003)	**.01(.001)**
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.004)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	.72(.014)	.66(.014)	.63(.014)	.60(.014)	.57(.015)
	25%	.64(.031)	.48(.032)	.40(.031)	.32(.031)	.25(.028)
	50%	.72(.029)	.66(.031)	.63(.029)	.59(.033)	.55(.032)
	75%	.76(.026)	.75(.027)	.74(.027)	.73(.028)	.72(.026)
	100%	.77(.027)	.77(.025)	.77(.026)	.77(.028)	.77(.028)
	Error	.48(.005)	.18(.004)	.07(.003)	**.02(.001)**	**.00(.000)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.59(.002)	.70(.002)
24	Total	.77(.013)	.70(.014)	.66(.013)	.63(.014)	.60(.013)
	25%	.67(.032)	.48(.033)	.38(.030)	.28(.027)	.21(.027)
	50%	.77(.024)	.69(.029)	.66(.031)	.62(.032)	.58(.031)
	75%	**.81(.024)**	**.80(.025)**	.79(.026)	.78(.023)	.77(.026)
	100%	**.83(.024)**	**.82(.025)**	**.82(.024)**	**.82(.025)**	**.82(.023)**
	Error	.48(.005)	.13(.004)	**.04(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	**.80(.012)**	.73(.013)	.68(.013)	.64(.013)	.61(.013)
	25%	.69(.027)	.48(.031)	.35(.030)	.26(.028)	.18(.023)
	50%	**.80(.027)**	.73(.029)	.68(.029)	.64(.032)	.59(.032)
	75%	**.85(.023)**	**.83(.024)**	**.83(.024)**	**.82(.024)**	**.81(.024)**
	100%	**.87(.021)**	**.86(.022)**	**.87(.023)**	**.86(.021)**	**.86(.021)**
	Error	.46(.005)	.09(.003)	**.02(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.49(.001)	.59(.001)	.70(.001)
		Random Uniform Responding				
8	Total	.65(.015)	.63(.014)	.61(.015)	.59(.015)	.58(.014)
	25%	.60(.033)	.52(.030)	.47(.035)	.42(.030)	.37(.030)
	50%	.65(.029)	.63(.031)	.61(.029)	.60(.032)	.58(.028)
	75%	.67(.029)	.67(.029)	.67(.028)	.66(.030)	.67(.029)

	100%	.68(.029)	.68(.031)	.68(.030)	.68(.031)	.68(.030)
	Error	.49(.005)	.26(.004)	.15(.003)	.07(.003)	**.01(.001)**
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.003)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	.73(.013)	.69(.013)	.67(.015)	.64(.014)	.62(.015)
	25%	.67(.028)	.54(.031)	.47(.031)	.41(.030)	.34(.028)
	50%	.74(.028)	.69(.028)	.67(.032)	.65(.031)	.63(.030)
	75%	.76(.029)	.76(.028)	.75(.026)	.75(.026)	.74(.028)
	100%	.77(.024)	.77(.027)	.77(.027)	.77(.027)	.77(.029)
	Error	.48(.005)	.18(.004)	.07(.003)	**.02(.001)**	**.00(.000)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.58(.002)	.69(.001)
24	Total	.78(.013)	.73(.013)	.70(.014)	.68(.014)	.65(.014)
	25%	.70(.029)	.55(.030)	.47(.033)	.39(.030)	.31(.028)
	50%	.79(.026)	.74(.027)	.71(.029)	.69(.031)	.66(.030)
	75%	**.82(.024)**	**.81(.024)**	**.80(.025)**	**.80(.026)**	.79(.023)
	100%	**.83(.024)**	**.82(.024)**	**.82(.025)**	**.82(.023)**	**.83(.024)**
	Error	.48(.005)	.13(.004)	**.04(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.18(.002)	.37(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	**.82(.011)**	.76(.012)	.73(.014)	.70(.014)	.66(.012)
	25%	.72(.028)	.56(.031)	.46(.031)	.37(.033)	.29(.028)
	50%	**.82(.022)**	.77(.025)	.75(.029)	.72(.028)	.68(.026)
	75%	**.86(.023)**	**.84(.023)**	**.84(.024)**	**.84(.024)**	**.83(.023)**
	100%	**.86(.021)**	**.86(.023)**	**.86(.024)**	**.86(.021)**	**.85(.022)**
	Error	.46(.005)	.09(.003)	**.02(.001)**	**.00(.000)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.001)	.49(.001)	.59(.001)	.70(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 24.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .3 and dependence of 0.25.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	.73(.014)	.70(.014)	.67(.014)	.66(.015)	.63(.015)
	25%	.68(.031)	.58(.030)	.51(.031)	.46(.035)	.39(.030)
	50%	.73(.028)	.69(.029)	.67(.030)	.65(.030)	.62(.032)
	75%	.76(.027)	.75(.028)	.75(.025)	.74(.028)	.73(.026)
	100%	.77(.027)	.77(.025)	.76(.027)	.77(.026)	.76(.029)
	Error	.59(.005)	.34(.005)	.21(.004)	.11(.003)	**.03(.002)**
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.004)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	**.83(.012)**	.79(.013)	.76(.012)	.73(.014)	.69(.014)
	25%	.77(.028)	.63(.032)	.55(.032)	.46(.032)	.38(.031)
	50%	**.83(.025)**	.78(.024)	.76(.025)	.73(.028)	.70(.028)
	75%	**.86(.021)**	**.85(.022)**	**.84(.022)**	**.84(.024)**	**.83(.021)**
	100%	**.87(.022)**	**.87(.020)**	**.87(.022)**	**.87(.021)**	**.87(.021)**
	Error	.63(.005)	.30(.005)	.14(.003)	**.04(.002)**	**.01(.001)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.59(.002)	.70(.002)
24	Total	**.89(.009)**	**.83(.011)**	**.80(.011)**	.76(.012)	.73(.013)
	25%	**.82(.025)**	.67(.029)	.57(.028)	.45(.028)	.35(.030)
	50%	**.89(.019)**	**.84(.022)**	**.81(.026)**	.78(.028)	.74(.027)
	75%	**.92(.017)**	**.91(.019)**	**.90(.018)**	**.90(.019)**	**.89(.020)**
	100%	**.92(.018)**	**.92(.019)**	**.92(.017)**	**.92(.017)**	**.92(.018)**
	Error	.67(.005)	.26(.004)	.10(.003)	**.02(.001)**	**.00(.000)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	**.92(.009)**	**.87(.010)**	**.82(.011)**	.79(.011)	.75(.011)
	25%	**.86(.022)**	.69(.030)	.56(.030)	.46(.034)	.34(.031)
	50%	**.92(.017)**	**.88(.022)**	**.85(.022)**	**.82(.025)**	.78(.026)
	75%	**.95(.014)**	**.94(.015)**	**.93(.015)**	**.93(.016)**	**.92(.016)**
	100%	**.95(.014)**	**.95(.014)**	**.95(.014)**	**.95(.013)**	**.95(.013)**
	Error	.68(.005)	.23(.004)	.06(.002)	**.01(.001)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.49(.001)	.59(.001)	.70(.001)
		Random Uniform Responding				
8	Total	.74(.013)	.71(.013)	.70(.015)	.68(.014)	.66(.013)
	25%	.69(.029)	.61(.031)	.56(.035)	.52(.032)	.46(.032)
	50%	.74(.027)	.72(.028)	.71(.028)	.69(.028)	.67(.029)
	75%	.76(.026)	.76(.026)	.75(.027)	.75(.025)	.75(.027)

	100%	.76(.026)	.76(.027)	.77(.027)	.76(.028)	.77(.027)
	Error	.59(.005)	.34(.005)	.21(.004)	.11(.003)	**.03(.002)**
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.003)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	**.84(.011)**	**.81(.012)**	.78(.013)	.76(.013)	.74(.013)
	25%	.79(.026)	.68(.028)	.62(.031)	.55(.033)	.48(.030)
	50%	**.85(.022)**	**.81(.025)**	**.80(.026)**	.78(.028)	.76(.027)
	75%	**.86(.022)**	**.86(.022)**	**.85(.023)**	**.85(.021)**	**.85(.023)**
	100%	**.87(.020)**	**.87(.022)**	**.87(.021)**	**.87(.021)**	**.87(.023)**
	Error	.63(.005)	.30(.005)	.14(.003)	**.04(.002)**	**.01(.001)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.58(.002)	.69(.001)
24	Total	**.90(.009)**	**.86(.010)**	**.83(.011)**	**.81(.012)**	.78(.013)
	25%	**.84(.023)**	.73(.028)	.66(.030)	.57(.031)	.48(.033)
	50%	**.90(.020)**	**.87(.021)**	**.85(.023)**	**.83(.023)**	**.81(.025)**
	75%	**.92(.017)**	**.91(.017)**	**.91(.019)**	**.91(.019)**	**.90(.019)**
	100%	**.92(.016)**	**.92(.017)**	**.92(.017)**	**.92(.017)**	**.92(.018)**
	Error	.67(.005)	.26(.004)	.10(.003)	**.02(.001)**	**.00(.000)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.18(.002)	.37(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	**.93(.008)**	**.89(.010)**	**.86(.010)**	**.84(.011)**	**.80(.010)**
	25%	**.87(.020)**	.76(.026)	.67(.029)	.58(.031)	.48(.029)
	50%	**.93(.015)**	**.91(.020)**	**.89(.021)**	**.87(.021)**	**.85(.022)**
	75%	**.95(.014)**	**.94(.016)**	**.94(.015)**	**.94(.015)**	**.93(.015)**
	100%	**.95(.012)**	**.95(.014)**	**.95(.015)**	**.95(.013)**	**.95(.014)**
	Error	.68(.005)	.23(.004)	.06(.002)	**.01(.001)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.001)	.49(.001)	.59(.001)	.70(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 25.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .4 and dependence of 0.25.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	**.81(.012)**	.78(.012)	.76(.012)	.74(.014)	.71(.014)
	25%	.77(.026)	.68(.028)	.61(.031)	.56(.033)	.48(.032)
	50%	**.81(.024)**	.78(.026)	.76(.026)	.74(.029)	.71(.028)
	75%	**.83(.024)**	**.82(.025)**	**.82(.023)**	**.82(.025)**	**.81(.025)**
	100%	**.84(.023)**	**.84(.022)**	**.84(.022)**	**.84(.024)**	**.84(.023)**
	Error	.68(.005)	.45(.005)	.30(.005)	.17(.004)	.05(.002)
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.004)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	**.91(.009)**	**.88(.010)**	**.86(.011)**	**.83(.011)**	**.80(.012)**
	25%	**.87(.022)**	.77(.027)	.70(.030)	.61(.031)	.52(.032)
	50%	**.91(.018)**	**.88(.021)**	**.87(.021)**	**.84(.022)**	**.82(.025)**
	75%	**.93(.016)**	**.93(.017)**	**.92(.016)**	**.92(.017)**	**.91(.018)**
	100%	**.94(.016)**	**.94(.015)**	**.94(.016)**	**.94(.014)**	**.94(.015)**
	Error	.77(.005)	.45(.005)	.26(.005)	.09(.003)	**.01(.001)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.59(.002)	.70(.002)
24	Total	**.96(.006)**	**.92(.008)**	**.90(.009)**	**.87(.009)**	**.83(.011)**
	25%	**.92(.017)**	**.83(.023)**	.75(.028)	.64(.029)	.53(.032)
	50%	**.96(.012)**	**.93(.013)**	**.92(.017)**	**.90(.019)**	**.88(.020)**
	75%	**.97(.010)**	**.97(.012)**	**.96(.012)**	**.96(.011)**	**.96(.012)**
	100%	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.011)**	**.97(.010)**
	Error	.83(.004)	.45(.005)	.21(.004)	.05(.002)	**.00(.001)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	**.98(.005)**	**.95(.007)**	**.92(.008)**	**.89(.009)**	**.86(.009)**
	25%	**.95(.013)**	**.86(.023)**	.77(.026)	.68(.031)	.55(.031)
	50%	**.98(.009)**	**.96(.013)**	**.95(.014)**	**.93(.016)**	**.91(.019)**
	75%	**.99(.007)**	**.98(.008)**	**.98(.008)**	**.98(.009)**	**.98(.009)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.86(.004)	.44(.005)	.16(.004)	**.03(.002)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.002)	.49(.001)	.59(.001)	.70(.001)
		Random Uniform Responding				
8	Total	**.81(.013)**	.79(.012)	.78(.012)	.76(.014)	.74(.012)
	25%	.78(.028)	.71(.028)	.66(.031)	.62(.031)	.56(.031)
	50%	**.82(.026)**	.79(.026)	.78(.026)	.77(.026)	.76(.026)
	75%	**.83(.024)**	**.83(.021)**	**.83(.022)**	**.82(.021)**	**.82(.023)**

	100%	**.83(.024)**	**.84(.023)**	**.84(.024)**	**.84(.023)**	**.84(.024)**
	Error	.68(.005)	.45(.005)	.30(.005)	.17(.004)	.05(.002)
	Pre	.19(.004)	.40(.003)	.51(.003)	.62(.002)	.77(.002)
	Post	.17(.003)	.36(.003)	.47(.003)	.57(.003)	.71(.002)
16	Total	**.92(.009)**	**.89(.010)**	**.88(.010)**	**.86(.010)**	**.84(.011)**
	25%	**.89(.020)**	**.81(.025)**	.75(.028)	.70(.028)	.62(.029)
	50%	**.92(.017)**	**.90(.018)**	**.89(.020)**	**.87(.021)**	**.86(.023)**
	75%	**.93(.015)**	**.93(.018)**	**.93(.016)**	**.93(.015)**	**.92(.017)**
	100%	**.94(.014)**	**.94(.015)**	**.94(.015)**	**.94(.014)**	**.94(.016)**
	Error	.77(.005)	.45(.005)	.26(.005)	.09(.003)	**.01(.001)**
	Pre	.20(.003)	.41(.002)	.52(.002)	.64(.002)	.76(.001)
	Post	.18(.003)	.37(.002)	.47(.002)	.58(.002)	.69(.001)
24	Total	**.96(.006)**	**.94(.007)**	**.92(.008)**	**.90(.009)**	**.88(.010)**
	25%	**.93(.015)**	**.86(.022)**	**.81(.024)**	.74(.028)	.67(.031)
	50%	**.96(.011)**	**.95(.014)**	**.94(.015)**	**.93(.016)**	**.91(.018)**
	75%	**.97(.010)**	**.97(.010)**	**.97(.012)**	**.97(.012)**	**.96(.012)**
	100%	**.97(.011)**	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.010)**
	Error	.83(.004)	.45(.005)	.21(.004)	.05(.002)	**.00(.001)**
	Pre	.20(.002)	.41(.002)	.52(.001)	.64(.001)	.77(.001)
	Post	.18(.002)	.37(.002)	.48(.001)	.59(.001)	.71(.001)
32	Total	**.98(.005)**	**.96(.006)**	**.95(.007)**	**.93(.008)**	**.90(.009)**
	25%	**.96(.012)**	**.90(.018)**	**.85(.023)**	.78(.026)	.69(.029)
	50%	**.98(.009)**	**.97(.011)**	**.96(.012)**	**.96(.013)**	**.94(.014)**
	75%	**.99(.008)**	**.98(.008)**	**.98(.007)**	**.98(.008)**	**.98(.009)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.86(.004)	.44(.005)	.16(.004)	**.03(.002)**	**.00(.000)**
	Pre	.21(.002)	.41(.002)	.53(.001)	.65(.001)	.77(.001)
	Post	.19(.002)	.38(.001)	.49(.001)	.59(.001)	.70(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 26.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .1 and dependence of 0.5.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.56(.017)	.53(.015)	.52(.015)	.50(.015)	.48(.016)
	25%	.51(.033)	.43(.031)	.39(.030)	.35(.031)	.30(.028)
	50%	.56(.032)	.53(.030)	.51(.032)	.50(.033)	.48(.030)
	75%	.59(.032)	.58(.032)	.58(.030)	.57(.031)	.57(.030)
	100%	.59(.031)	.59(.031)	.59(.030)	.59(.031)	.59(.031)
	Error	.43(.005)	.26(.004)	.17(.004)	.09(.003)	**.03(.002)**
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.15(.004)	.30(.003)	.38(.003)	.50(.003)	.64(.003)
16	Total	.60(.015)	.55(.015)	.53(.016)	.51(.015)	.49(.014)
	25%	.52(.032)	.40(.031)	.35(.031)	.28(.028)	.23(.028)
	50%	.60(.032)	.54(.032)	.52(.032)	.49(.032)	.47(.032)
	75%	.63(.029)	.62(.030)	.62(.030)	.61(.031)	.60(.030)
	100%	.65(.030)	.64(.030)	.65(.031)	.64(.030)	.65(.030)
	Error	.40(.005)	.17(.004)	.09(.003)	**.02(.002)**	**.01(.001)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
24	Total	.62(.015)	.57(.016)	.54(.016)	.52(.015)	.50(.013)
	25%	.53(.034)	.40(.032)	.31(.030)	.26(.029)	.20(.025)
	50%	.62(.031)	.57(.030)	.53(.032)	.50(.032)	.47(.032)
	75%	.66(.031)	.65(.032)	.64(.027)	.64(.030)	.63(.030)
	100%	.68(.030)	.68(.030)	.68(.028)	.68(.032)	.68(.027)
	Error	.37(.005)	.13(.004)	**.04(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.50(.002)	.64(.001)
32	Total	.64(.015)	.58(.015)	.55(.015)	.52(.014)	.50(.015)
	25%	.54(.031)	.37(.032)	.29(.031)	.22(.025)	.17(.024)
	50%	.64(.030)	.57(.030)	.54(.034)	.50(.032)	.46(.032)
	75%	.69(.028)	.68(.029)	.67(.031)	.66(.031)	.65(.031)
	100%	.70(.027)	.71(.028)	.71(.028)	.71(.029)	.71(.030)
	Error	.35(.005)	.09(.003)	**.03(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.31(.002)	.40(.002)	.52(.002)	.64(.001)
		Random Uniform Responding				
8	Total	.57(.016)	.55(.016)	.54(.015)	.53(.015)	.51(.016)
	25%	.53(.031)	.47(.031)	.43(.034)	.40(.029)	.35(.031)
	50%	.57(.032)	.55(.032)	.54(.032)	.53(.034)	.52(.035)
	75%	.59(.034)	.58(.031)	.58(.031)	.58(.031)	.58(.033)

	100%	.59(.034)	.59(.031)	.59(.031)	.60(.029)	.59(.032)
	Error	.43(.005)	.26(.004)	.17(.004)	.09(.003)	**.03(.002)**
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.14(.004)	.29(.003)	.38(.003)	.50(.003)	.63(.002)
16	Total	.61(.016)	.58(.014)	.56(.015)	.54(.016)	.53(.015)
	25%	.55(.032)	.45(.030)	.41(.031)	.35(.030)	.30(.029)
	50%	.61(.031)	.58(.031)	.56(.029)	.55(.031)	.53(.030)
	75%	.64(.031)	.63(.031)	.62(.031)	.63(.030)	.62(.030)
	100%	.65(.031)	.64(.032)	.64(.030)	.65(.031)	.65(.030)
	Error	.40(.005)	.17(.004)	.09(.003)	**.02(.002)**	**.01(.001)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
24	Total	.64(.015)	.60(.016)	.58(.015)	.55(.015)	.54(.015)
	25%	.56(.033)	.45(.032)	.38(.030)	.33(.029)	.28(.027)
	50%	.64(.032)	.60(.030)	.58(.030)	.56(.030)	.54(.034)
	75%	.67(.030)	.66(.029)	.66(.030)	.65(.032)	.65(.029)
	100%	.68(.029)	.68(.030)	.68(.030)	.67(.029)	.68(.030)
	Error	.37(.005)	.13(.004)	**.04(.002)**	**.01(.001)**	**.00(.000)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.49(.002)	.64(.001)
32	Total	.66(.014)	.61(.015)	.59(.015)	.56(.014)	.54(.014)
	25%	.57(.031)	.44(.031)	.37(.028)	.30(.028)	.25(.026)
	50%	.66(.028)	.62(.029)	.59(.030)	.57(.029)	.55(.030)
	75%	.70(.028)	.69(.028)	.69(.029)	.68(.028)	.68(.028)
	100%	.71(.029)	.71(.031)	.70(.027)	.71(.029)	.71(.027)
	Error	.35(.005)	.09(.003)	**.03(.002)**	**.00(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.30(.002)	.39(.002)	.52(.001)	.64(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 27.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .2 and dependence of 0.5.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.65(.016)	.62(.016)	.61(.015)	.59(.015)	.57(.016)
	25%	.60(.034)	.52(.031)	.49(.034)	.43(.034)	.38(.030)
	50%	.65(.031)	.62(.030)	.61(.033)	.59(.032)	.57(.031)
	75%	.67(.030)	.67(.030)	.67(.029)	.66(.029)	.66(.030)
	100%	.68(.029)	.68(.031)	.68(.028)	.68(.030)	.68(.030)
	Error	.52(.005)	.34(.005)	.24(.004)	.13(.003)	**.04(.002)**
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.15(.004)	.30(.003)	.38(.003)	.50(.003)	.64(.003)
16	Total	.73(.014)	.69(.014)	.67(.015)	.64(.015)	.61(.014)
	25%	.67(.032)	.55(.031)	.49(.032)	.41(.030)	.34(.031)
	50%	.73(.029)	.68(.030)	.66(.031)	.64(.031)	.61(.030)
	75%	.76(.026)	.75(.027)	.75(.029)	.74(.029)	.74(.029)
	100%	.77(.028)	.77(.026)	.77(.027)	.77(.026)	.77(.027)
	Error	.54(.005)	.27(.005)	.16(.004)	.05(.002)	**.01(.001)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
24	Total	.78(.013)	.74(.014)	.70(.015)	.68(.014)	.65(.013)
	25%	.71(.028)	.58(.032)	.48(.032)	.42(.033)	.33(.029)
	50%	.78(.026)	.74(.027)	.70(.028)	.68(.030)	.65(.030)
	75%	**.82(.025)**	**.81(.027)**	**.80(.024)**	**.80(.024)**	.79(.026)
	100%	**.83(.025)**	**.83(.025)**	**.82(.024)**	**.82(.026)**	**.83(.023)**
	Error	.56(.005)	.25(.004)	.10(.003)	**.03(.002)**	**.00(.001)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.50(.002)	.64(.001)
32	Total	**.82(.012)**	.76(.013)	.73(.013)	.70(.013)	.66(.014)
	25%	.74(.029)	.58(.033)	.49(.034)	.39(.030)	.31(.030)
	50%	**.82(.024)**	.77(.026)	.74(.029)	.70(.029)	.66(.030)
	75%	**.85(.022)**	**.84(.021)**	**.84(.023)**	**.83(.023)**	**.82(.026)**
	100%	**.86(.020)**	**.86(.020)**	**.86(.022)**	**.87(.021)**	**.86(.023)**
	Error	.57(.005)	.21(.004)	.08(.003)	**.01(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.31(.002)	.40(.002)	.52(.002)	.64(.001)
		Random Uniform Responding				
8	Total	.66(.015)	.64(.016)	.63(.014)	.62(.014)	.60(.014)
	25%	.62(.030)	.56(.032)	.53(.034)	.49(.031)	.44(.032)
	50%	.66(.031)	.64(.032)	.63(.032)	.62(.030)	.61(.033)
	75%	.68(.030)	.67(.030)	.67(.028)	.67(.031)	.67(.031)

	100%	.68(.030)	.68(.030)	.68(.027)	.68(.025)	.68(.030)
	Error	.52(.005)	.34(.005)	.24(.004)	.13(.003)	**.04(.002)**
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.14(.004)	.29(.003)	.38(.003)	.50(.003)	.63(.002)
	Total	.74(.014)	.71(.013)	.69(.014)	.68(.014)	.66(.014)
	25%	.69(.031)	.60(.030)	.55(.030)	.49(.033)	.43(.031)
	50%	.74(.028)	.71(.029)	.70(.028)	.69(.028)	.67(.027)
16	75%	.77(.027)	.76(.026)	.75(.026)	.76(.024)	.75(.028)
	100%	.77(.027)	.77(.027)	.77(.027)	.78(.029)	.77(.028)
	Error	.54(.005)	.27(.005)	.16(.004)	.05(.002)	**.01(.001)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
	Total	.79(.014)	.76(.014)	.74(.013)	.72(.013)	.69(.013)
	25%	.73(.030)	.64(.032)	.56(.031)	.50(.032)	.44(.029)
	50%	.79(.025)	.77(.027)	.75(.027)	.73(.028)	.71(.027)
24	75%	**.82(.026)**	**.81(.025)**	**.81(.028)**	**.80(.026)**	**.80(.025)**
	100%	**.83(.024)**	**.83(.024)**	**.83(.025)**	**.82(.025)**	**.83(.024)**
	Error	.56(.005)	.25(.004)	.10(.003)	**.03(.002)**	**.00(.001)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.49(.002)	.64(.001)
	Total	**.83(.011)**	.79(.012)	.77(.013)	.74(.013)	.72(.013)
	25%	.76(.026)	.65(.027)	.58(.031)	.49(.033)	.43(.032)
	50%	**.83(.023)**	**.80(.025)**	.78(.027)	.76(.026)	.74(.028)
32	75%	**.86(.022)**	**.85(.021)**	**.85(.022)**	**.85(.022)**	**.84(.023)**
	100%	**.86(.022)**	**.87(.022)**	**.86(.020)**	**.87(.022)**	**.87(.020)**
	Error	.57(.005)	.21(.004)	.08(.003)	**.01(.001)**	**.00(.000)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.30(.002)	.39(.002)	.52(.001)	.64(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 28.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .3 and dependence of 0.5.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.74(.014)	.71(.015)	.70(.014)	.68(.014)	.66(.014)
	25%	.70(.033)	.62(.032)	.58(.033)	.53(.032)	.47(.031)
	50%	.74(.026)	.71(.029)	.70(.031)	.68(.031)	.66(.030)
	75%	.76(.027)	.75(.027)	.75(.028)	.75(.027)	.74(.027)
	100%	.76(.026)	.76(.026)	.76(.027)	.77(.026)	.76(.027)
	Error	.62(.005)	.43(.005)	.32(.005)	.18(.004)	.07(.003)
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.15(.004)	.30(.003)	.38(.003)	.50(.003)	.64(.003)
16	Total	**.84(.012)**	**.81(.012)**	.79(.012)	.76(.013)	.73(.013)
	25%	.79(.027)	.69(.031)	.64(.032)	.55(.031)	.47(.033)
	50%	**.84(.023)**	**.81(.025)**	.79(.025)	.76(.027)	.74(.029)
	75%	**.86(.021)**	**.86(.022)**	**.85(.023)**	**.85(.022)**	**.84(.023)**
	100%	**.87(.022)**	**.87(.020)**	**.87(.021)**	**.87(.021)**	**.87(.021)**
	Error	.69(.004)	.41(.005)	.26(.005)	.09(.003)	**.02(.001)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
24	Total	**.90(.009)**	**.86(.010)**	**.83(.011)**	**.81(.012)**	.78(.012)
	25%	**.85(.022)**	.75(.026)	.67(.030)	.59(.031)	.49(.031)
	50%	**.89(.020)**	**.87(.020)**	**.84(.023)**	**.83(.025)**	**.80(.026)**
	75%	**.92(.017)**	**.91(.018)**	**.91(.017)**	**.91(.017)**	**.90(.018)**
	100%	**.92(.018)**	**.92(.017)**	**.92(.017)**	**.92(.017)**	**.92(.016)**
	Error	.74(.004)	.43(.005)	.20(.004)	.08(.003)	**.01(.001)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.50(.002)	.64(.001)
32	Total	**.93(.008)**	**.89(.010)**	**.87(.010)**	**.83(.010)**	**.80(.011)**
	25%	**.88(.021)**	.78(.028)	.70(.030)	.59(.030)	.49(.032)
	50%	**.93(.016)**	**.90(.019)**	**.88(.021)**	**.86(.022)**	**.83(.022)**
	75%	**.95(.013)**	**.94(.013)**	**.94(.016)**	**.94(.016)**	**.93(.016)**
	100%	**.95(.014)**	**.95(.013)**	**.95(.014)**	**.95(.014)**	**.95(.014)**
	Error	.77(.004)	.40(.005)	.19(.004)	**.04(.002)**	**.01(.001)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.31(.002)	.40(.002)	.52(.002)	.64(.001)
		Random Uniform Responding				
8	Total	.75(.014)	.73(.014)	.71(.013)	.70(.014)	.69(.013)
	25%	.71(.029)	.65(.030)	.62(.031)	.58(.030)	.53(.032)
	50%	.75(.027)	.73(.029)	.72(.029)	.71(.029)	.70(.030)
	75%	.76(.026)	.76(.027)	.76(.025)	.76(.028)	.75(.029)

	100%	.77(.027)	.77(.028)	.76(.026)	.77(.024)	.77(.027)
	Error	.62(.005)	.43(.005)	.32(.005)	.18(.004)	.07(.003)
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.14(.004)	.29(.003)	.38(.003)	.50(.003)	.63(.002)
	Total	**.85(.011)**	**.82(.012)**	**.81(.012)**	.79(.013)	.77(.013)
	25%	**.81(.026)**	.73(.026)	.69(.028)	.63(.033)	.57(.031)
	50%	**.85(.023)**	**.83(.025)**	**.82(.024)**	**.81(.023)**	.79(.026)
16	75%	**.87(.020)**	**.86(.020)**	**.86(.020)**	**.86(.021)**	**.86(.022)**
	100%	**.87(.022)**	**.87(.022)**	**.87(.022)**	**.87(.022)**	**.87(.023)**
	Error	.69(.004)	.41(.005)	.26(.005)	.09(.003)	**.02(.001)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
	Total	**.90(.010)**	**.88(.010)**	**.86(.011)**	**.84(.012)**	**.82(.011)**
	25%	**.86(.023)**	.79(.027)	.73(.029)	.68(.031)	.61(.029)
	50%	**.90(.020)**	**.89(.021)**	**.87(.020)**	**.86(.023)**	**.85(.022)**
24	75%	**.92(.017)**	**.92(.017)**	**.92(.018)**	**.91(.018)**	**.91(.019)**
	100%	**.92(.018)**	**.92(.017)**	**.92(.017)**	**.92(.019)**	**.92(.018)**
	Error	.74(.004)	.43(.005)	.20(.004)	.08(.003)	**.01(.001)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.49(.002)	.64(.001)
	Total	**.93(.008)**	**.91(.009)**	**.89(.009)**	**.87(.010)**	**.85(.010)**
	25%	**.90(.019)**	**.82(.022)**	.77(.026)	.69(.032)	.62(.030)
	50%	**.94(.015)**	**.92(.017)**	**.91(.020)**	**.89(.018)**	**.89(.021)**
32	75%	**.95(.014)**	**.95(.014)**	**.94(.014)**	**.94(.014)**	**.94(.016)**
	100%	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.013)**
	Error	.77(.004)	.40(.005)	.19(.004)	**.04(.002)**	**.01(.001)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.30(.002)	.39(.002)	.52(.001)	.64(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 29.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .4 and dependence of 0.5.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	**.82(.012)**	.79(.013)	.78(.013)	.76(.014)	.74(.013)
	25%	.78(.029)	.71(.028)	.68(.030)	.63(.030)	.56(.030)
	50%	**.82(.023)**	.79(.026)	.78(.027)	.76(.026)	.75(.028)
	75%	**.83(.023)**	**.83(.023)**	**.82(.024)**	**.82(.025)**	**.82(.025)**
	100%	**.83(.022)**	**.84(.024)**	**.83(.024)**	**.84(.025)**	**.84(.024)**
	Error	.71(.005)	.54(.005)	.42(.005)	.26(.005)	.10(.003)
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.15(.004)	.30(.003)	.38(.003)	.50(.003)	.64(.003)
16	Total	**.92(.009)**	**.89(.009)**	**.88(.010)**	**.86(.011)**	**.83(.011)**
	25%	**.89(.021)**	**.82(.025)**	.77(.028)	.70(.029)	.62(.031)
	50%	**.92(.016)**	**.90(.019)**	**.89(.020)**	**.87(.022)**	**.85(.024)**
	75%	**.93(.015)**	**.93(.016)**	**.93(.016)**	**.92(.018)**	**.92(.018)**
	100%	**.94(.016)**	**.94(.016)**	**.94(.015)**	**.94(.015)**	**.94(.015)**
	Error	.81(.004)	.57(.005)	.41(.005)	.17(.004)	**.04(.002)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
24	Total	**.96(.006)**	**.94(.007)**	**.92(.008)**	**.91(.009)**	**.88(.009)**
	25%	**.94(.015)**	**.88(.020)**	**.82(.023)**	.76(.027)	.67(.030)
	50%	**.96(.013)**	**.95(.015)**	**.93(.016)**	**.92(.018)**	**.91(.018)**
	75%	**.97(.010)**	**.97(.011)**	**.97(.011)**	**.96(.012)**	**.96(.012)**
	100%	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.010)**	**.97(.010)**
	Error	.87(.003)	.63(.005)	.37(.005)	.18(.004)	**.03(.002)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.50(.002)	.64(.001)
32	Total	**.98(.005)**	**.96(.006)**	**.95(.007)**	**.93(.008)**	**.90(.009)**
	25%	**.96(.012)**	**.91(.019)**	**.86(.022)**	.78(.026)	.69(.030)
	50%	**.98(.009)**	**.97(.010)**	**.96(.012)**	**.95(.013)**	**.94(.015)**
	75%	**.99(.007)**	**.98(.008)**	**.98(.009)**	**.98(.008)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.006)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.91(.003)	.64(.005)	.39(.005)	.11(.003)	**.01(.001)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.31(.002)	.40(.002)	.52(.002)	.64(.001)
		Random Uniform Responding				
8	Total	**.82(.012)**	**.80(.012)**	.79(.012)	.78(.013)	.77(.012)
	25%	.79(.026)	.74(.028)	.71(.030)	.67(.030)	.62(.030)
	50%	**.82(.025)**	**.81(.025)**	.79(.026)	.79(.028)	.78(.026)
	75%	**.83(.025)**	**.83(.023)**	**.83(.024)**	**.83(.024)**	**.82(.025)**

	100%	**.84(.023)**	**.84(.026)**	**.83(.023)**	**.84(.023)**	**.84(.023)**
	Error	.71(.005)	.54(.005)	.42(.005)	.26(.005)	.10(.003)
	Pre	.16(.004)	.32(.003)	.42(.003)	.54(.003)	.70(.002)
	Post	.14(.004)	.29(.003)	.38(.003)	.50(.003)	.63(.002)
16	Total	**.92(.008)**	**.90(.009)**	**.89(.010)**	**.88(.010)**	**.86(.011)**
	25%	**.90(.019)**	**.84(.022)**	**.81(.025)**	.76(.029)	.71(.029)
	50%	**.92(.018)**	**.91(.018)**	**.90(.019)**	**.89(.019)**	**.88(.021)**
	75%	**.94(.015)**	**.93(.015)**	**.93(.016)**	**.93(.015)**	**.93(.016)**
	100%	**.94(.015)**	**.94(.017)**	**.94(.015)**	**.94(.015)**	**.94(.016)**
	Error	.81(.004)	.57(.005)	.41(.005)	.17(.004)	**.04(.002)**
	Pre	.16(.002)	.34(.003)	.43(.002)	.57(.002)	.70(.002)
	Post	.15(.002)	.31(.003)	.39(.002)	.52(.002)	.64(.002)
24	Total	**.96(.006)**	**.95(.007)**	**.94(.007)**	**.93(.008)**	**.91(.008)**
	25%	**.95(.015)**	**.90(.019)**	**.87(.021)**	**.83(.025)**	.77(.027)
	50%	**.96(.012)**	**.96(.014)**	**.95(.014)**	**.94(.015)**	**.93(.015)**
	75%	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.011)**	**.97(.011)**
	100%	**.97(.011)**	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.010)**
	Error	.87(.003)	.63(.005)	.37(.005)	.18(.004)	**.03(.002)**
	Pre	.16(.002)	.32(.002)	.44(.002)	.54(.002)	.70(.001)
	Post	.15(.002)	.30(.002)	.40(.002)	.49(.002)	.64(.001)
32	Total	**.98(.004)**	**.97(.005)**	**.96(.006)**	**.95(.007)**	**.93(.007)**
	25%	**.97(.011)**	**.93(.016)**	**.90(.018)**	**.86(.024)**	**.80(.025)**
	50%	**.98(.009)**	**.98(.010)**	**.97(.011)**	**.97(.011)**	**.96(.012)**
	75%	**.99(.007)**	**.99(.008)**	**.98(.008)**	**.99(.007)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.006)**	**.99(.007)**	**.99(.007)**
	Error	.91(.003)	.64(.005)	.39(.005)	.11(.003)	**.01(.001)**
	Pre	.16(.002)	.33(.002)	.43(.001)	.57(.001)	.70(.001)
	Post	.15(.002)	.30(.002)	.39(.002)	.52(.001)	.64(.001)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 30.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .1 and dependence of 0.75.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.57(.015)	.56(.014)	.54(.016)	.54(.014)	.51(.015)
	25%	.54(.030)	.49(.030)	.46(.032)	.44(.032)	.38(.032)
	50%	.57(.030)	.55(.030)	.54(.031)	.54(.032)	.52(.032)
	75%	.59(.031)	.58(.030)	.58(.031)	.58(.029)	.58(.034)
	100%	.59(.033)	.59(.031)	.59(.031)	.59(.033)	.59(.033)
	Error	.48(.005)	.36(.005)	.26(.005)	.21(.004)	.06(.003)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	.61(.014)	.59(.015)	.58(.016)	.56(.015)	.54(.016)
	25%	.56(.032)	.50(.034)	.47(.032)	.42(.030)	.36(.030)
	50%	.61(.030)	.59(.032)	.57(.030)	.56(.031)	.54(.031)
	75%	.63(.027)	.63(.030)	.63(.030)	.62(.030)	.62(.031)
	100%	.64(.029)	.64(.029)	.65(.031)	.64(.030)	.64(.029)
	Error	.46(.006)	.31(.005)	.22(.005)	.11(.003)	**.03(.002)**
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	.64(.016)	.61(.015)	.59(.015)	.57(.014)	.56(.015)
	25%	.58(.033)	.49(.032)	.45(.031)	.39(.031)	.34(.029)
	50%	.64(.033)	.61(.030)	.59(.032)	.57(.032)	.55(.032)
	75%	.67(.028)	.66(.030)	.65(.033)	.65(.029)	.65(.030)
	100%	.68(.029)	.68(.029)	.68(.030)	.68(.028)	.68(.030)
	Error	.47(.005)	.26(.004)	.15(.004)	.06(.002)	**.02(.001)**
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.52(.002)
32	Total	.67(.015)	.64(.014)	.61(.014)	.58(.015)	.56(.014)
	25%	.61(.029)	.51(.034)	.44(.029)	.37(.029)	.31(.027)
	50%	.67(.028)	.63(.029)	.60(.032)	.58(.030)	.56(.031)
	75%	.70(.028)	.69(.028)	.68(.029)	.68(.029)	.67(.030)
	100%	.71(.027)	.71(.027)	.71(.030)	.71(.030)	.71(.028)
	Error	.49(.005)	.26(.005)	.12(.003)	**.04(.002)**	**.01(.001)**
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)
		Random Uniform Responding				
8	Total	.58(.016)	.57(.015)	.56(.015)	.55(.015)	.54(.016)
	25%	.55(.030)	.52(.031)	.49(.033)	.47(.031)	.43(.034)
	50%	.58(.034)	.57(.028)	.56(.032)	.56(.029)	.55(.030)
	75%	.59(.030)	.59(.032)	.59(.032)	.58(.030)	.59(.030)

	100%	.59(.032)	.59(.032)	.59(.031)	.58(.030)	.60(.032)
	Error	.48(.005)	.36(.005)	.26(.005)	.21(.004)	.06(.003)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	.62(.016)	.61(.015)	.60(.014)	.58(.016)	.57(.015)
	25%	.58(.030)	.54(.031)	.51(.035)	.47(.033)	.44(.032)
	50%	.62(.033)	.61(.029)	.60(.030)	.59(.034)	.58(.031)
	75%	.64(.032)	.64(.031)	.63(.029)	.63(.031)	.63(.030)
	100%	.64(.032)	.65(.029)	.64(.029)	.64(.029)	.64(.028)
	Error	.46(.006)	.31(.005)	.22(.005)	.11(.003)	**.03(.002)**
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	.65(.014)	.63(.015)	.62(.015)	.61(.014)	.59(.016)
	25%	.61(.029)	.54(.033)	.51(.030)	.46(.031)	.42(.031)
	50%	.65(.029)	.63(.030)	.62(.034)	.61(.031)	.60(.030)
	75%	.67(.029)	.67(.029)	.67(.031)	.67(.030)	.66(.030)
	100%	.68(.029)	.68(.029)	.68(.030)	.68(.028)	.68(.028)
	Error	.47(.005)	.26(.004)	.15(.004)	.06(.002)	**.02(.001)**
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.51(.002)
32	Total	.67(.014)	.65(.015)	.64(.016)	.62(.015)	.60(.016)
	25%	.62(.032)	.56(.028)	.50(.032)	.45(.031)	.40(.034)
	50%	.68(.028)	.66(.031)	.64(.030)	.62(.033)	.62(.032)
	75%	.70(.030)	.70(.030)	.69(.030)	.69(.029)	.69(.029)
	100%	.70(.029)	.70(.028)	.71(.030)	.71(.030)	.71(.030)
	Error	.49(.005)	.26(.005)	.12(.003)	**.04(.002)**	**.01(.001)**
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 31.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .2 and dependence of 0.75.

Pairs	Severity	0.2	0.4	0.5	0.6	0.7
		Random Normal Responding				
8	Total	.66(.014)	.65(.014)	.63(.015)	.63(.014)	.60(.015)
	25%	.63(.029)	.59(.031)	.55(.033)	.53(.032)	.46(.033)
	50%	.66(.029)	.65(.028)	.63(.031)	.63(.030)	.60(.029)
	75%	.68(.029)	.67(.029)	.67(.031)	.67(.028)	.67(.033)
	100%	.68(.031)	.68(.029)	.68(.031)	.68(.029)	.68(.032)
	Error	.57(.005)	.45(.005)	.33(.005)	.27(.005)	.09(.003)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	.74(.013)	.72(.015)	.71(.013)	.69(.014)	.67(.015)
	25%	.70(.028)	.64(.033)	.61(.030)	.56(.030)	.49(.031)
	50%	.74(.027)	.72(.030)	.71(.026)	.70(.029)	.68(.030)
	75%	.76(.026)	.76(.027)	.76(.026)	.75(.027)	.75(.029)
	100%	.77(.026)	.77(.026)	.77(.025)	.77(.026)	.77(.028)
	Error	.61(.005)	.45(.006)	.34(.005)	.19(.004)	.06(.003)
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.80(.014)**	.77(.013)	.75(.014)	.73(.013)	.71(.013)
	25%	.75(.028)	.67(.030)	.62(.030)	.56(.031)	.50(.032)
	50%	**.80(.028)**	.77(.027)	.76(.028)	.74(.026)	.72(.027)
	75%	**.82(.024)**	**.81(.025)**	**.81(.025)**	**.81(.025)**	**.81(.023)**
	100%	**.83(.024)**	**.82(.023)**	**.83(.025)**	**.83(.022)**	**.83(.024)**
	Error	.65(.004)	.43(.005)	.28(.005)	.13(.003)	**.03(.002)**
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.52(.002)
32	Total	**.84(.012)**	**.81(.013)**	.79(.013)	.76(.012)	.74(.012)
	25%	.79(.025)	.72(.030)	.65(.028)	.57(.030)	.49(.028)
	50%	**.83(.022)**	**.81(.026)**	.79(.027)	.77(.025)	.75(.027)
	75%	**.86(.020)**	**.85(.022)**	**.85(.023)**	**.84(.022)**	**.84(.025)**
	100%	**.86(.021)**	**.86(.023)**	**.87(.021)**	**.87(.021)**	**.86(.021)**
	Error	.70(.005)	.46(.005)	.26(.004)	.10(.003)	**.02(.001)**
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)
		Random Uniform Responding				
8	Total	.67(.015)	.66(.014)	.65(.014)	.64(.014)	.63(.016)
	25%	.64(.031)	.61(.030)	.58(.032)	.56(.032)	.51(.035)
	50%	.67(.031)	.66(.026)	.65(.030)	.65(.026)	.64(.029)
	75%	.68(.028)	.68(.031)	.68(.029)	.67(.029)	.68(.030)

	100%	.68(.029)	.68(.029)	.68(.030)	.67(.030)	.69(.031)
	Error	.57(.005)	.45(.005)	.33(.005)	.27(.005)	.09(.003)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	.75(.014)	.74(.014)	.73(.013)	.72(.014)	.70(.014)
	25%	.71(.028)	.67(.030)	.65(.033)	.61(.030)	.57(.033)
	50%	.75(.027)	.74(.026)	.73(.028)	.72(.029)	.72(.028)
	75%	.77(.027)	.77(.026)	.76(.025)	.76(.030)	.76(.027)
	100%	.77(.027)	.77(.027)	.77(.025)	.77(.026)	.77(.025)
	Error	.61(.005)	.45(.006)	.34(.005)	.19(.004)	.06(.003)
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.80(.013)**	.79(.013)	.78(.014)	.76(.012)	.75(.013)
	25%	.77(.026)	.70(.030)	.68(.028)	.63(.029)	.59(.029)
	50%	**.80(.026)**	.79(.026)	.78(.027)	.77(.025)	.76(.025)
	75%	**.82(.025)**	**.82(.023)**	**.82(.025)**	**.82(.025)**	**.81(.025)**
	100%	**.83(.023)**	**.83(.023)**	**.83(.025)**	**.83(.024)**	**.82(.023)**
	Error	.65(.004)	.43(.005)	.28(.005)	.13(.003)	**.03(.002)**
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.51(.002)
32	Total	**.84(.012)**	**.83(.011)**	**.81(.012)**	.79(.013)	.78(.012)
	25%	**.80(.025)**	.75(.027)	.70(.028)	.65(.033)	.60(.032)
	50%	**.84(.022)**	**.83(.024)**	**.82(.026)**	**.81(.027)**	**.80(.024)**
	75%	**.86(.022)**	**.86(.022)**	**.86(.022)**	**.85(.023)**	**.85(.023)**
	100%	**.86(.021)**	**.86(.022)**	**.86(.021)**	**.86(.020)**	**.86(.022)**
	Error	.70(.005)	.46(.005)	.26(.004)	.10(.003)	**.02(.001)**
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 32.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .3 and dependence of 0.75.

Pairs	Severity	Random Normal Responding				
		0.2	0.4	0.5	0.6	0.7
8	Total	.75(.014)	.73(.013)	.72(.015)	.72(.013)	.69(.014)
	25%	.72(.027)	.68(.030)	.64(.032)	.63(.033)	.55(.031)
	50%	.75(.027)	.73(.026)	.72(.030)	.72(.027)	.69(.027)
	75%	.76(.028)	.76(.027)	.76(.028)	.76(.025)	.75(.029)
	100%	.76(.027)	.76(.026)	.77(.028)	.76(.026)	.76(.029)
	Error	.67(.005)	.55(.005)	.43(.005)	.35(.005)	.13(.004)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	**.85(.011)**	**.83(.012)**	**.83(.011)**	**.81(.012)**	.79(.013)
	25%	**.82(.025)**	.77(.029)	.74(.027)	.69(.027)	.63(.032)
	50%	**.85(.022)**	**.83(.025)**	**.82(.023)**	**.81(.025)**	**.80(.024)**
	75%	**.87(.021)**	**.86(.022)**	**.86(.022)**	**.86(.022)**	**.85(.022)**
	100%	**.87(.022)**	**.87(.022)**	**.87(.022)**	**.87(.021)**	**.87(.022)**
	Error	.74(.005)	.60(.005)	.49(.005)	.31(.005)	.10(.003)
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.91(.009)**	**.89(.010)**	**.87(.011)**	**.86(.010)**	**.84(.011)**
	25%	**.88(.019)**	**.82(.025)**	.78(.026)	.73(.028)	.66(.029)
	50%	**.91(.020)**	**.89(.020)**	**.88(.021)**	**.87(.021)**	**.85(.022)**
	75%	**.92(.017)**	**.92(.018)**	**.91(.017)**	**.91(.017)**	**.91(.016)**
	100%	**.92(.016)**	**.92(.017)**	**.92(.018)**	**.92(.016)**	**.92(.016)**
	Error	.81(.004)	.62(.005)	.46(.006)	.25(.004)	.07(.003)
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.52(.002)
32	Total	**.94(.007)**	**.92(.009)**	**.91(.009)**	**.89(.009)**	**.87(.010)**
	25%	**.92(.017)**	**.87(.022)**	**.82(.023)**	.76(.027)	.68(.026)
	50%	**.94(.015)**	**.93(.016)**	**.91(.017)**	**.90(.019)**	**.89(.021)**
	75%	**.95(.014)**	**.95(.014)**	**.94(.015)**	**.94(.016)**	**.94(.016)**
	100%	**.95(.012)**	**.95(.014)**	**.95(.013)**	**.95(.014)**	**.95(.013)**
	Error	.86(.004)	.68(.005)	.46(.005)	.22(.004)	.05(.002)
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)
		Random Uniform Responding				
8	Total	.75(.013)	.74(.013)	.73(.013)	.72(.014)	.71(.015)
	25%	.73(.027)	.70(.029)	.67(.031)	.65(.032)	.60(.035)
	50%	.75(.029)	.74(.025)	.74(.029)	.73(.027)	.72(.028)
	75%	.76(.026)	.76(.026)	.76(.027)	.75(.027)	.76(.028)

	100%	.77(.027)	.76(.028)	.77(.026)	.76(.027)	.77(.025)
	Error	.67(.005)	.55(.005)	.43(.005)	.35(.005)	.13(.004)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	**.85(.011)**	**.84(.012)**	**.84(.012)**	**.83(.012)**	**.81(.013)**
	25%	**.83(.024)**	.79(.027)	.77(.028)	.74(.027)	.70(.031)
	50%	**.86(.021)**	**.85(.023)**	**.84(.025)**	**.83(.025)**	**.83(.024)**
	75%	**.87(.022)**	**.86(.023)**	**.86(.021)**	**.86(.025)**	**.86(.022)**
	100%	**.87(.023)**	**.87(.022)**	**.87(.021)**	**.87(.022)**	**.87(.021)**
	Error	.74(.005)	.60(.005)	.49(.005)	.31(.005)	.10(.003)
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.91(.009)**	**.90(.009)**	**.89(.010)**	**.88(.009)**	**.87(.010)**
	25%	**.88(.020)**	**.84(.025)**	**.82(.025)**	.78(.025)	.75(.026)
	50%	**.91(.019)**	**.90(.018)**	**.89(.019)**	**.89(.019)**	**.88(.020)**
	75%	**.92(.017)**	**.92(.018)**	**.92(.019)**	**.92(.018)**	**.92(.017)**
	100%	**.92(.016)**	**.92(.016)**	**.92(.017)**	**.93(.017)**	**.92(.016)**
	Error	.81(.004)	.62(.005)	.46(.006)	.25(.004)	.07(.003)
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.51(.002)
32	Total	**.94(.007)**	**.93(.007)**	**.92(.008)**	**.91(.009)**	**.90(.009)**
	25%	**.92(.017)**	**.89(.020)**	**.86(.020)**	**.82(.026)**	.77(.027)
	50%	**.94(.015)**	**.93(.016)**	**.93(.017)**	**.92(.017)**	**.92(.017)**
	75%	**.95(.015)**	**.95(.012)**	**.95(.016)**	**.95(.014)**	**.95(.015)**
	100%	**.95(.013)**	**.95(.013)**	**.95(.013)**	**.95(.012)**	**.95(.014)**
	Error	.86(.004)	.68(.005)	.46(.005)	.22(.004)	.05(.002)
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 33.

Mean power, error, and mean Psychometric Synonym index in negatively skewed data with an empirical cutoff of .4 and dependence of 0.75.

	Severity	Random Normal Responding				
Pairs		0.2	0.4	0.5	0.6	0.7
8	Total	**.82(.012)**	**.81(.011)**	**.80(.014)**	.79(.011)	.77(.014)
	25%	**.80(.025)**	.77(.028)	.73(.027)	.72(.031)	.65(.030)
	50%	**.82(.023)**	**.81(.022)**	**.80(.026)**	**.80(.027)**	.78(.026)
	75%	**.84(.024)**	**.83(.023)**	**.83(.025)**	**.83(.022)**	**.82(.024)**
	100%	**.84(.022)**	**.83(.023)**	**.84(.024)**	**.84(.022)**	**.84(.026)**
	Error	.75(.004)	.65(.005)	.53(.005)	.45(.005)	.20(.004)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	**.92(.009)**	**.92(.009)**	**.91(.008)**	**.90(.010)**	**.88(.010)**
	25%	**.90(.018)**	**.87(.025)**	**.85(.023)**	**.81(.023)**	.76(.027)
	50%	**.92(.016)**	**.92(.018)**	**.91(.018)**	**.90(.018)**	**.89(.019)**
	75%	**.93(.016)**	**.93(.015)**	**.93(.016)**	**.93(.016)**	**.93(.016)**
	100%	**.94(.016)**	**.94(.016)**	**.94(.015)**	**.94(.015)**	**.94(.016)**
	Error	.85(.004)	.75(.004)	.64(.005)	.46(.005)	.19(.004)
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.97(.006)**	**.96(.007)**	**.95(.007)**	**.94(.007)**	**.92(.008)**
	25%	**.95(.013)**	**.92(.017)**	**.90(.019)**	**.86(.022)**	**.81(.024)**
	50%	**.97(.012)**	**.96(.013)**	**.95(.013)**	**.95(.013)**	**.94(.015)**
	75%	**.97(.011)**	**.97(.011)**	**.97(.010)**	**.97(.011)**	**.97(.011)**
	100%	**.97(.010)**	**.97(.011)**	**.97(.010)**	**.97(.009)**	**.97(.009)**
	Error	.92(.003)	.79(.004)	.66(.005)	.42(.005)	.15(.004)
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.52(.002)
32	Total	**.98(.004)**	**.98(.005)**	**.97(.005)**	**.96(.006)**	**.94(.006)**
	25%	**.98(.010)**	**.96(.013)**	**.93(.017)**	**.90(.020)**	**.84(.020)**
	50%	**.98(.008)**	**.98(.009)**	**.98(.009)**	**.97(.011)**	**.96(.012)**
	75%	**.99(.007)**	**.99(.007)**	**.99(.008)**	**.99(.008)**	**.98(.008)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.007)**
	Error	.95(.002)	.86(.004)	.69(.005)	.42(.005)	.12(.004)
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)
		Random Uniform Responding				
8	Total	**.82(.011)**	**.82(.012)**	**.81(.012)**	**.80(.013)**	.79(.013)
	25%	**.80(.024)**	.78(.025)	.75(.029)	.73(.029)	.69(.032)
	50%	**.83(.026)**	**.81(.021)**	**.81(.025)**	**.80(.024)**	**.80(.027)**
	75%	**.84(.022)**	**.83(.024)**	**.83(.025)**	**.82(.024)**	**.83(.023)**

	100%	**.84(.023)**	**.83(.024)**	**.84(.022)**	**.83(.024)**	**.84(.022)**
	Error	.75(.004)	.65(.005)	.53(.005)	.45(.005)	.20(.004)
	Pre	.11(.004)	.22(.004)	.33(.004)	.40(.004)	.61(.003)
	Post	.10(.004)	.20(.004)	.30(.004)	.36(.003)	.56(.003)
16	Total	**.93(.008)**	**.92(.009)**	**.91(.009)**	**.90(.009)**	**.90(.009)**
	25%	**.91(.018)**	**.89(.022)**	**.87(.021)**	**.84(.022)**	**.81(.026)**
	50%	**.93(.016)**	**.92(.016)**	**.92(.018)**	**.91(.018)**	**.91(.019)**
	75%	**.94(.016)**	**.93(.016)**	**.93(.016)**	**.93(.016)**	**.93(.015)**
	100%	**.94(.016)**	**.94(.015)**	**.93(.014)**	**.94(.015)**	**.94(.015)**
	Error	.85(.004)	.75(.004)	.64(.005)	.46(.005)	.19(.004)
	Pre	.12(.003)	.22(.003)	.29(.002)	.40(.003)	.57(.002)
	Post	.11(.003)	.20(.003)	.27(.002)	.37(.002)	.52(.002)
24	Total	**.97(.006)**	**.96(.006)**	**.95(.006)**	**.95(.007)**	**.94(.007)**
	25%	**.95(.013)**	**.93(.016)**	**.92(.017)**	**.89(.020)**	**.87(.019)**
	50%	**.97(.011)**	**.96(.012)**	**.96(.013)**	**.96(.013)**	**.95(.013)**
	75%	**.97(.010)**	**.97(.011)**	**.97(.011)**	**.97(.011)**	**.97(.011)**
	100%	**.97(.010)**	**.97(.010)**	**.97(.010)**	**.97(.011)**	**.97(.010)**
	Error	.92(.003)	.79(.004)	.66(.005)	.42(.005)	.15(.004)
	Pre	.11(.002)	.23(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.10(.002)	.21(.002)	.28(.002)	.38(.002)	.51(.002)
32	Total	**.98(.004)**	**.98(.004)**	**.98(.005)**	**.97(.006)**	**.96(.006)**
	25%	**.98(.010)**	**.96(.012)**	**.95(.014)**	**.93(.017)**	**.90(.020)**
	50%	**.98(.008)**	**.98(.008)**	**.98(.009)**	**.98(.009)**	**.97(.009)**
	75%	**.99(.008)**	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.008)**
	100%	**.99(.007)**	**.99(.007)**	**.99(.007)**	**.99(.006)**	**.99(.007)**
	Error	.95(.002)	.86(.004)	.69(.005)	.42(.005)	.12(.004)
	Pre	.10(.002)	.21(.002)	.31(.002)	.42(.002)	.57(.002)
	Post	.09(.002)	.19(.002)	.28(.002)	.38(.002)	.52(.002)

Note. Numbers in parentheses are standard deviations of their respective means. Pre = average psychometric synonym before introducing IER; Post = average psychometric synonym after introducing IER; Total = power estimate across all levels of severity; Pairs-Row equals strength of within-pair correlation and column represents the number of pairs. Bold indicates an acceptable rate for either power or error.

Table 34

Supplemental analysis with psychometric synonyms with within-pair correlation strength of 0.7, 32 pairs, and normally distributed random responding.

	0 Dependence		0.75 Dependence	
	Normal	Skewed	Normal	Skewed
0%	.834 (.058)	.816 (.065)	.581 (.130)	.573 (.154)
25%	.465 (.158)	.423 (.162)	.213 (.187)	.197 (.196)
50%	.202 (.182)	.183 (.181)	.075 (.185)	.072 (.185)
75%	.051 (.182)	.046 (.182)	.014 (.181)	.014 (.181)
100%	.001 (.178)	-.001 (.179)	-.001 (.180)	.001 (.179)

Note. Percentages include all levels of IER severity. Normal and Skewed represent their respective conditions for the data. Numbers outside of parentheses are the mean indices for their respective conditions and the numbers in parentheses are the SDs.

Table 35.
Summary of recommended cut-off indices for the use of Psychological Synonyms in normally distributed data.

		Within-Pair Correlation				
# of Pairs	Dependence	.2	.4	.5	.6	.7
8	0	-	-	-	≤ .2	≤ .4
	.25	-	-	-	≤ .1	≤ .3
	.5	-	-	-	-	≤ .2
	.75	-	-	-	-	-
16	0	-	-	≤ .2	≤ .4^	≤ .4^
	.25	-	-	≤ .1	≤ .3^	≤ .4^
	.5	-	-	-	≤ .2	≤ .4*
	.75	-	-	-	-	≤ .2
24	0	-	≤ .1	≤ .3^	≤ .4*	≤ .4^
	.25	-	≤ .1	≤ .2	≤ .3^	≤ .4*
	.5	-	-	≤ .1	≤ .2	≤ .4*
	.75	-	-	-	-	≤ .3*
32	0	-	≤ .2	≤ .3^	≤ .4*	≤ .4^
	.25	-	≤ .1	≤ .2	≤ .4*	≤ .4*
	.5	-	-	≤ .1	≤ .3*	≤ .4*
	.75	-	-	-	≤ .1	≤ .3*

Note. "-" = cut-off not found within the study. * = acceptable total power (≥ 0.80) and error estimates in normally distributed and uniform random responding conditions. ^ = Acceptable power and error rates combined for uniform, but not normally distributed random responding. All cut-offs presented within the table have acceptable error rates (< 0.05). To be conservative, these recommendations are based on detecting random responding that follow a normal distribution. For uniform random responding, the cut-off could be slightly larger. However, I believe that these cut-offs should be treated as maximums and therefore should be applied to detect either form of random responding.

Table 36.
Summary of maximum recommended cut-off indices for the use of Psychological Synonyms in negatively skewed data.

		Within-Pair Correlation				
# of Pairs	Dependence	.2	.4	.5	.6	.7
8	0	-	-	-	≤ .2	≤ .4
	.25	-	-	-	-	≤ .3
	.5	-	-	-	-	≤ .2
	.75	-	-	-	-	-
16	0	-	-	≤ .2	≤ .4*	≤ .4^
	.25	-	-	≤ .1	≤ .3	≤ .4*
	.5	-	-	-	≤ .1	≤ .4*
	.75	-	-	-	-	≤ .1
24	0	-	≤ .1	≤ .3^	≤ .4*	≤ .4*
	.25	-	-	≤ .2	≤ .3^	≤ .4*
	.5	-	-	≤ .1	≤ .2	≤ .4*
	.75	-	-	-	-	≤ .2
32	0	-	≤ .1	≤ .3^	≤ .4*	≤ .4*
	.25	-	≤ .1	≤ .2	≤ .4*	≤ .4*
	.5	-	-	≤ .1	≤ .3*	≤ .4*
	.75	-	-	-	≤ .1	≤ .2

Note. “-“ = cut-off not found within the study. * = acceptable total power (≥ 0.80) and error estimates. All cut-offs presented within the table have acceptable error rates (< 0.05). To be conservative, these recommendations are based on detecting random responding that follow a normal distribution. For uniform random responding, the cut-off could be slightly more relaxed. However, I believe that these cut-offs should be treated as maximums and therefore should be applied to detect either form of random responding.

Appendix A

```
set.seed(1)
options(stringsAsFactors = F)
library(stringr)
library(data.table)

test.mat=CJ(c("1_2","2_1"),c("3_4","4_3"),c("5_6","6_5"),c("7_8","8_7"),c("9_10","10_9"),
c("11_12","12_11"),c("13_14","14_13"),c("15_16","16_15"),c("17_18","18_17"),c("19_20",
"20_19"),c("21_22","22_21"),c("23_24","24_23"),c("25_26","26_25"),c("27_28","28_27"),c
("29_30","30_29"))

correlatedValue = function(x, r){
  r2 = r**2
  ve = 1-r2
  SD = sqrt(ve)
  e  = rnorm(length(x), mean=0, sd=SD)
  y  = r*x + e
  return(y)
}
x = rnorm(15)
y = correlatedValue(x=x, r=.1)
data=cbind(x,y)
cor(x,y)
data=c(x[1],y[1],x[2],y[2],x[3],y[3],x[4],y[4],x[5],y[5],x[6],y[6],x[7],y[7],x[8],y[8],x[9],y[9],
x[10],y[10],x[11],y[11],x[12],y[12],x[13],y[13],x[14],y[14],x[15],y[15])

result=matrix(nrow=nrow(test.mat), ncol=1)

for(r in 1:nrow(test.mat)){
  check=as.data.frame(str_split(test.mat[r,],"_"))
  vec1=data[c(as.numeric(check[1,]))]
  vec2=data[c(as.numeric(check[2,]))]
  result[r,1]=cor(vec1,vec2)
}

hist(result)
mean(result)
sd(result)
min(result)
max(result)
```