



VALIDITY AND RELIABILITY STUDIES

IDEAL Voice is a screening instrument and training diagnostic developed and licensed by the Ideal Dialogue Company of Tampa, Florida.

A study of the IDEAL Voice agent audition system was conducted over a one-year period ending in November 2009. The purpose of the study was to determine the validity and reliability of the IDEAL Voice analytic model. The study was conducted by James Keaten, Ph. D. and Professor of Communication Studies at the University of Northern Colorado.

The study followed the scientific method to gage the accuracy of the IDEAL Voice system when measuring the social competence of voices. Social competence of voice was defined as “a human perception of five characteristics: influential, dedicated, engaging, articulate, and likeable.”

Twenty potential call center agents of varied cultural backgrounds were recorded during scripted and unscripted speech. IDEAL Voice technology was used to create an acoustic analysis of each recorded voice based on 23 vocal cues. The validity of the IDEAL Voice technology would depend largely on the accuracy of the theory that these 23 vocal traits were the constituent drivers of human perceptions.

Over a period of months, the 20 candidates' voice recordings were heard and scored by 25 impartial volunteers representing a cross-section of U.S. American consumers. The volunteers used a 12-item index to log their perceptions and judgments of each recorded potential call center agent.

Results of the human evaluations were highly consistent with the IDEAL Voice analyses. This outcome supported that the scientific basis of IDEAL Voice—the index of 23 specific vocal traits—is an accurate foundation for voice analysis when used in predicting human perceptions. Moreover, it supports IDEAL Voice validity and reliability as a system for measuring the social competence of a potential call center agent's voice.



Ecological Validity

To match the daily demands of the customer support industry, IDEAL Voice uses scoring systems that can be calibrated to match specific requirements of each call center environment and current market demands.

Specially trained analysts at The Ideal Dialogue Company measure the vocal ability of applicants according to the calibrated standards of each client.

The IDEAL Dialogue Company's use of human analytics ensures superior accuracy of predicting human perceptions when compared to fully automated systems.

Content Validity

IDEAL Voice 2.0 measures 23 distinct cues that constitute the acoustic spectrum of the human voice. In the 2009 study by James Keaten, Ph.D., Communication and Statistics, 20 candidates auditioning for positions as call center agents read a carefully designed script containing a wide range of the phonemes found in Standard American English. They also responded to open-ended questions (in most cases, three). This process provided recordings of scripted and unscripted speech.

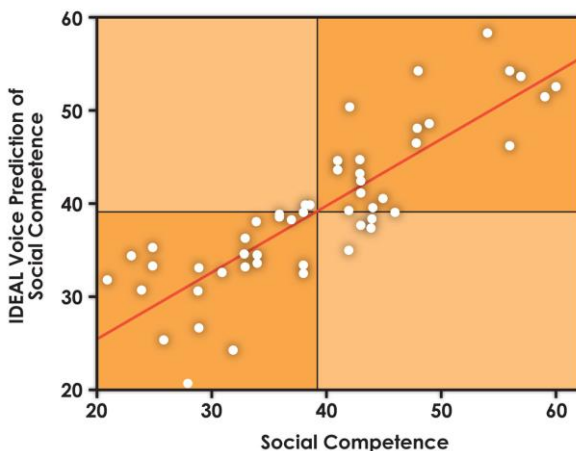
Each candidate was evaluated using IDEAL Voice methodology. The theory being tested was that IDEAL Voice scoring based on 23 specific vocal cues would accurately predict human perceptions of influential, dedicated, engaging, articulate, and likeable voices.

Predictive Validity

A correlational study was conducted to test the ability of the IDEAL Voice agent audition system to predict perceptions of social competence. Twenty-five impartial volunteers representing a cross-section of American consumers measured the social competence of the same voices analyzed by IDEAL Voice. The volunteers' measurements were based on a 12-item index using seven-point semantic differential scales.¹

A step-wise multifactor regression revealed that IDEAL Voice predicted 72% of the variation in Social Competence scores. Figure 1 illustrates the accuracy of IDEAL Voice in predicting perceptions of Social Competence, $R = .85$, $F(7, 42) = 15.2$, $p < .001$.

SCATTER PLOT OF SOCIAL COMPETENCE BY IDEAL VOICE PREDICTION



¹ The Social Competence Index was treated as unidimensional scale because all items loaded most heavily on the first factor of a Principal Components Analysis. In addition, the internal consistency of the index was very high ($\alpha = .95$).

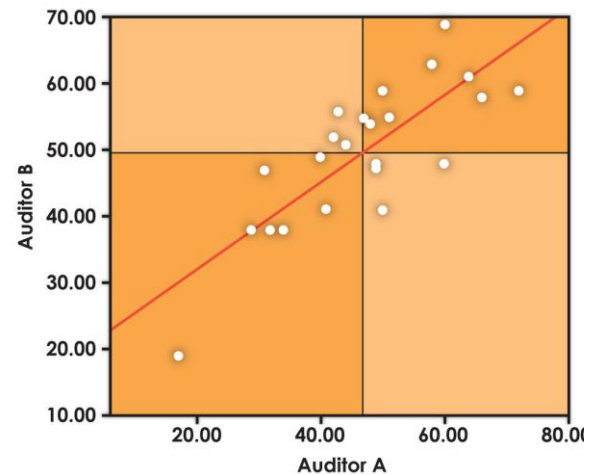
Reliability

Three auditors assessed hundreds of candidate auditions from three global regions: (1) Latin America, (2) South East Asia, and (3) Southern Asia. A single-factor experimental design was created to test the inter-rater reliability of IDEAL Voice. The theory being tested was that human perceptions could be measured consistently with IDEAL Voice predictions given a larger intercultural sample. The between-subjects factor, auditor pairing, consisted of three levels (A & B; A & C; B & C). Candidate auditions were randomly assigned to each of the three conditions. To increase the equivalence of the three experimental conditions, the marginal means were tested for consistency. To assess inter-rater reliability, the intra-class correlation coefficient was calculated.¹ As illustrated in Figure 2, results showed a high level of reliability between auditors for scripted speech, $\rho_1 = .77$, $t(23) = 8.20$, $p < .001$.

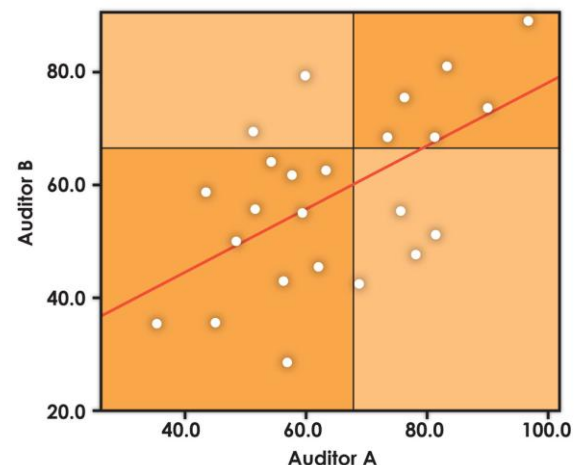
The same procedure was used to estimate the inter-rater reliability of unscripted speech. Results again indicated a very high level of agreement, $\rho_1 = .86$, $t(23) = 12.42$, $p < .001$, confirming the theory that human perceptions could be measured consistently with IDEAL Voice predictions given a larger intercultural sample.

¹ Pearson's Product Moment Correlation r is not an accurate statistic for estimating reliability because, although r measures the alignment of data points, it does not account for location (i.e., absolute score) on the IDEAL Voice scale. Because IDEAL Voice color bands are determined solely by numerical score, the matching of absolute location must be part of the reliability estimate.

SCATTER PLOT IF IDEAL VOICE
SCRIPTED SPEECH



SCATTER PLOT IF IDEAL VOICE
UNSCRIPTED SPEECH



CONCLUSION

Scientific research provides unequivocal support for the validity and reliability of IDEAL Voice as a measure of vocal ability. The instrument is designed to measure a broad spectrum of voice cues in a situation that matches the daily demands of the customer support industry. Research data show that IDEAL Voice is a highly reliable instrument that accurately predicts perceptions of social competence.