

# **GROCERY STORE COIN TEST**

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## **EXECUTIVE SUMMARY Of VALIDATION RESEARCH**

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## **Purpose of the Executive Summary**

This summary of the COIN TEST Validation Study is designed to be an overview, in the non-technical terms, of the research, development and validation of the COIN TEST. Every effort has been made to present this material free from the specialized jargon of statistics and research. The purpose of such jargon is to increase the precision of language used to describe technical work. Avoiding it will at times result in our making more general statements than would otherwise be the case. We accept this difficulty in order to clarify the research finding for the non-technical reader. A more in-depth, technically precise explanation of the issues presented here is available in the full validation report on the COIN TEST (technical report # 1410)

## **Description of the COIN TEST**

The COIN TEST is a timed, multiple choice test that is administered in a paper-and-pencil or in a computer-administered format. It is an analog of the task of calculating the correct amount of money due to a customer during typical retail transactions and then translating that figure into the correct combination of coins and currency. The assumptions that underlie the COIN TEST are:

- a critical part of a the job for anyone who handles money is to be able to do so accurately under time pressure;
- translating a dollar and cents figure into the correct combination of coins and currency is a specific skill that varies among individuals and involves reasoning ability as well as arithmetic skills.
- in general, the better the reasoning ability in a person handling money, the better the money-handling skills of that person.

## **Development**

The COIN TEST was constructed by developing multiple choice test questions that are expressed in terms of typical retail transactions. To avoid penalizing test takers who might not be experienced with industry-specific equipment or procedures, the test questions do not assume any knowledge or experience. The tests questions are arranged from easier to more difficult. The number of test items in the COIN TEST was held to thirty in order to meet the statistical requirements of test reliability without unduly fatiguing the test taker.

A preliminary study was conducted to determine how to time the COIN TEST in order to simulate the time pressure imposed by a line of impatient customers. Readability level was kept at the fifth grade level in order to make the test easy to read and understand. In this way, reading difficulty did not become an unwanted influence on how well a person was able to perform the calculations required by the test.

## **Study Design and Data Collection**

The research study was designed to address issues of content-related, construct, and criterion validity. The study was designed and conducted according to the American Psychological Association's Standards for Educational and Psychological Testing.

The COIN TEST was administered to over 277 subjects in 20 grocery/retail stores from a national chain. The COIN TEST was administered to applicants immediately after they were hired as part of the orientation procedure. Criterion data were collected to 90 days of employment for each participant. After eliminating subjects with incomplete, incorrect, or questionable data, 262 were included in statistical analyses.

COIN TEST results and criterion measurement data showed no unacceptable restriction of range. There was wide dispersion of number correct on the COIN TEST, as well as for each of the criterion measures.

A scoring procedure was developed and tested that expresses results of the individual's COIN TEST score in terms of his or her ability to handle money accurately.

## **VALIDITY**

### ***Content Validity***

Content validity is the extent to which a sample of the items, tasks or questions is representative of some defined domain of content. The COIN TEST was developed specifically to focus on a critical aspect of the cashier's job – that is, the ability to handle money accurately and to translate dollars and cents figures

into correct combinations of coins and currency. Thus, the COIN TEST meets the requirement of content validity.

### ***Construct Validity***

Construct validity is a way of determining how well a tool, or test, measures the construct, or psychological characteristic, it has been designed to measure. The COIN TEST measures the construct of ability to handle accurately. The dispersion of number of correct answers for the 262 subjects who participated in the validity study closely resembles the bell-shaped (Gaussian) curve, supporting its construct validity. In addition, comparisons of the COIN TEST with other validated, standardized tests of general cognitive ability and arithmetic skills showed strong correlations.

### ***Criterion Validity***

Criterion validity is a way of comparing the results of the test with other, independently-gathered measures of performance. Criterion data were gathered for the first 90 days of each subject's employment tenure after administration of the COIN TEST, and included cash overs and shorts by day, number of customer complaints about errors, and direct supervisor's rating of ability to handle money accurately. The data gathered on 262 subjects supported the relationship between performance on the COIN TEST and the criteria of cash overs and cash shorts and supervisor's rating of individual's ability to make change.

## **EEOC Concerns**

The scoring procedure for the COIN TEST does not adjust scores on the basis of race, color, religion, sex, or national origin, in compliance with U.S. employment law as amended by Section 106 of the Civil Rights Act of 1991 and the Americans with Disabilities Act (ADA) of 1990.

### **Summary of Results**

The COIN TEST is a psychometric instrument that measures the ability to compute correct dollars and cents figures in answer to specific problems and then translate those figures into the correct combination of coins and currency. The skill measured by the COIN TEST correlates significantly with behavior on the job of cashier, establishing the COIN TEST as an instrument with valid predictive power.

The COIN TEST is designed to be used as part of the evaluation of prospective applicants and incumbents for jobs that require the accurate handling or counting of money in retail situations. It is intended to give an employer an indication of an applicant's ability to handle money accurately under time pressure. It may be used with applicants or incumbents (for example in training programs) to identify individuals whose level of ability may lead to costly mistakes, so that remedial measures, such as training or reassignment, can be taken. When it is used with job applicants, the COIN TEST is intended to be used as one part of a process that includes interviews, background checks and reference checks.

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