AN ALTERNATIVE APPROACH TO THE METHOD OF CORRECT MATCHING

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The correct matching method is treated in a new way which increases its power and enables the results to be expressed by a correlation coefficient. Tables for $3 \leq n \leq 7$ are included.

The correct matching method [1] is well known. In several papers [e.g., 3, 4, 5, 6] one can find good descriptions of it, and detailed evaluations of its strong and weak points.

This paper will present an alternative approach to the correct matching problem, which results in a different technique and analysis of the data, the main advantages of which are as follows.

(i) Utilization of more information in given data, thus increasing the test’s power.
(ii) Simplifying the judges’ task, thus possibly increasing their efficiency.
(iii) The problem of matching order [6] does not exist at all, thus avoiding its unmeasurable effects.
(iv) Presenting the research results in terms of a correlation coefficient, thus quantifying the extent of validity instead of merely stating “valid” or “invalid.”
(v) No assumptions whatsoever are made.

Procedure

Two uncontaminated personality assessment methods, $X$ and $Y$, are chosen. Then $n$ subjects are assessed separately and independently by each method, giving us $n$ personality descriptions by method $X$, and $n$ by method $Y$. Those of $X$ will be labeled $a, b, \ldots, n$ and those of $Y$ labeled $A, B, \ldots, N$.

Now we pick $n$ judges. Each judge receives one personality description by method $X$, and all $n$ descriptions by method $Y$ (or vice versa). Let us take judge 1, who receives $a$ and $A, B, \ldots, N$. He is asked which one of $A, B, \ldots, N$ is the best match for $a$. The one he chooses is scored 1. Then he is asked to choose the next best match for $a$, which is scored 2, etc. Thus we get a ranking of all possible matches for $a$, say $aP, aF, aD, \ldots$, or in a

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different form

\[ A \ B \ C \ \cdots \ N \]
\[ a \ 7 \ 3 \ 4 \ \cdots \ 6. \]

Judge 2 receives \( b \) and all \( A, B, \cdots, N \), and is asked to rank them as matches for \( b \). Thus from all the \( n \) judges we get \( n \) independent rankings (rows), which make up Table 1.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|c|}
\hline
Judge & X & A & B & \cdots & J & \cdots & N \\ \hline
1 & a & r_{aA} & r_{aB} & \cdots & r_{aJ} & \cdots & r_{aN} \\ \hline
2 & b & r_{bA} & r_{bB} & \cdots & r_{bJ} & \cdots & r_{bN} \\ \vdots & & & & & & & \\ i & i & r_{iA} & r_{iB} & \cdots & r_{iJ} & \cdots & r_{iN} \\ \vdots & & & & & & & \\ n & n & r_{nA} & r_{nB} & \cdots & r_{nJ} & \cdots & r_{nN} \\ \hline
\end{tabular}
\caption{n Independent Rankings (Rows) by n Judges}
\end{table}

As each judge has the simplified task of matching only one description, the problem of the order of matchings and its unmeasurable effects [6] does not arise at all. In [6] one can see that this is a considerable experimental gain.

\textit{Hypotheses}

According to \( H_1 \), method \( X \) is valid to method \( Y \) in the sense that the judges would be able to match the two descriptions made on each subject better than chance. In other words, the correct matchings \( aA, bB, \cdots, nN \) will receive better ranks than other cells in Table 1. If so, then the set of ranks \( r_{aA}, r_{bB}, \cdots, r_{nN} \) will be closer to 1, 1, \( \cdots \), 1 than the expectancy of all the sets of \( n \) ranks, sampled randomly and independently, one from each row. (Such sets will be labeled simply \( S \).) Thus, according to \( H_1 \) the following inequality of probabilities exists.

\[ P(r_{i=j} = 1) > P(r_{i=j} = 2) > \cdots > P(r_{i=j} = n). \]

According to \( H_0 \), \( X \) is not valid to \( Y \), and as the two methods are un-