Issues and Opinions

Patterns of Motivation: Beyond Differences Between IS and Non-IS People

In an investigation of motivational differences between information systems (IS) and non-information system (non-IS) people (Ferratt and Short, "Are Information Systems People Different: An Investigation of Motivational Differences, *MIS Quarterly* (10:4), December 1986, pp. 377–387), we measured a respondent's "pattern of dominant, evoked motivators of productive work behavior" using a constrained choice checklist. Much of the critique by Im and Hartman of the analyses we performed is based on a misunderstanding of two critical and concomitant items: (1) what a *pattern* of motivation is; and (2) appropriate uses of the data obtained via the constrained choice checklist. While additional responses to the critique could be presented, the scope of this article is limited to extending and responding to these earlier works by explaining and illustrating patterns of motivation and uses of a constrained choice checklist.

Patterns of Motivation

A pattern of motivation is defined as the relative strength of various motivators of behavior. Two assumptions about patterns of motivation guided our study. First, for any individual's pattern of motivation a limited number of motivators is highly evoked, while the remainder is not. Second, the motivators likely to be highly evoked depend upon the behavioral setting. Given the second assumption, motivators in a productive work behavior setting were measured. Given the first assumption, only 10 motivational items were sampled—two each from the five need domains of guidance, social, esteem, achievement, and power—providing the various motivators to define an individual's pattern of motivation.

We used a constrained choice checklist to measure patterns of motivation. Much of the hypothesis testing recommended by Im and Hart-

man would be interpretable if rating scales had been used; however, because a constrained choice checklist was used, it is not. Therefore, we will discuss both types of scales to clarify the misunderstanding.

Measuring Patterns of Motivation With Rating Scales

One way of measuring an individual's pattern of motivation is to use separate rating scales for each of the motivators and develop the pattern based on responses on the separate scales. Such scales allow for calculations of scores for each need measured and a comparison of one individual's (or group's) score to another. Using seven-point scales, for example, one individual may have a pattern of scores on the five needs, respectively, of 5.4 (guidance), 5.5 (social), 5.6 (esteem), 4.3 (achievement), and 4.2 (power), while another may have 4.3 (guidance), 4.8 (social), 5.7 (esteem), 6.1 (achievement), and 6.2 (power).

For the first individual, the pattern of motivation shows the most dominant need to be esteem followed by the social and guidance needs; for the second, the dominant need is power followed by achievement and esteem. With rating scales, comparing each of the needs separately for different groupings of individuals as suggested by Im and Hartman is interpretable. In this example, even though esteem is the dominant need for the first individual and is not for the second one, a comparison of the two individuals on that need alone shows that the rating of esteem is higher for the second individual.

If only one need were measured, e.g., esteem, this example would make it obvious that measurement of that single need alone provides an incomplete and perhaps misleading assessment of the dominant motivators for different individuals. Measurement across the five need domains provides a better assessment of an individual's or group's pattern of motivation. We focused on measuring and comparing *patterns* of motivation, not specific needs.

Measuring With a Constrained Choice Checklist

In our study, we used a constrained choice checklist, which constrains respondents to choose a limited set of items from a larger set. Specifically, respondents were asked to check up to five items (they could check fewer) from the set of 10 that would most likely encourage them to produce at their highest potential.

The resulting scale is known conceptually as an ipsative scale. The checked items are high relative to the unchecked items *within* the responding individual, *not necessarily across individuals.* The checked items receive a score of 1, while the unchecked items receive a score of 0. The item scores result in a ten-digit pattern of zeroes and ones for each individual. This pattern can be converted to a five-digit pattern if the items are grouped by the five need domains. Indeed, the item scores can be recoded into other patterns, as will be shown more fully below.

To illustrate the five-digit pattern, one individual may have checked two motivators from the guidance domain (for a score of 2), one from the social domain (for a score of 1), two from the esteem domain (for a score of 2), none from achievement (for a score of 0), and none from power (for a score of 0) for a 21200 pattern. Another may have checked none from guidance, none from social, two from esteem, two from achievement, and one from power for a 00221 pattern.

These two examples of patterns of motivation are quite different and are appropriate to use and compare just as any two nominal scores are compared (e.g., they are similar to man, which might be scored as 0, and woman, which might be scored as 1, on a gender scale). However, just as with any nominal scale, this scale does not permit direct ordinal, interval, or ratio comparisons of one individual's score with another individual's score. For example, comparing the social need strength, which is 1 for the first individual in the example above and 0 for the second, and concluding that the first individual has a higher social need strength than the second individual, is an inappropriate use of the data. That comparison is just as inappropriate and uninterpretable as saying a gender of 1 is higher than a gender of 0.

It is also inappropriate to examine responses to one or more items independently of the responses to all other items. Responses are made relative to all other items. Thus, the hypothesis tests by Im and Hartman comparing specific needs across IS and non-IS groups, rather than complete patterns of needs, are inappropriate and uninterpretable. An appropriate hypothesis test with data from a constrained choice checklist is illustrated below.

Using a Constrained Choice Checklist

One of the most powerful uses of the constrained choice checklist is to use Boolean logic with the scores on the items in the checklist to classify all individuals into a limited number of categories for further analysis. This use of the 10 variables in our checklist should classify each individual into one and only one category (i.e., pattern of motivation) of a mutually exclusive and exhaustive set of categories (i.e., patterns of motivation). Classification into five patterns for comparison of patterns of motivation with occupational groups is illustrated here.

Classification into one of the five patterns is based on the following logic. Pattern 1 is comprised of individuals with a zero for both authority and influence, i.e., it is comprised of those who did not check either of the power items. Patterns 2 through 4 are comprised of individuals who checked only one of the power items, i.e., either authority or influence is 1, but not both are 1. Pattern 5 is comprised of individuals who checked both power items.

The individuals with only one power item checked, i.e., those in neither pattern 1 nor 5, are further distinguished by whether they checked any of the social need items. Those who did not check any of the social need items, i.e., they have a zero for both supportive relationships and sympathetic understanding, are classified into pattern 4. Those checking at least one of the social need items are further distinguished by whether they checked any of the guidance need items. Those who did not check any of the guidance need items, i.e., they have a zero for both a clear job and feedback, are classified into pattern 3, while those checking at least one of the guidance need items are classified into pattern 2.

These five patterns reference only three need domains. Not using the other two domains in the classification procedure, however, does not imply that items from these two domains should be removed from the instrument. Nor does it imply that three of the needs are being examined independently of the other two. The unreferenced items are still instrumental in the individual's choice of the most highly evoked motivators. Furthermore, the five categories resulting from the classification procedure completely encompass all possible patterns, and a given pattern can occur in only one category.

The original data from the second random sample used to generate the results of our study were used to generate the data reported here. The relationship between motivational pattern and occupation is shown in Table 1. Chi-square is 142.4 with 8 degrees of freedom and significance beyond the .0000 level.

Table 1. Motivational Pattern, as Defined by the Five-Category Classification Procedure, and Occupation: Observed and Expected Values*

Second Sample
(Even Numbered Cases)
N = 502**

Motivational Pattern (Items checked)	Occupation			Total
	Clerical	Technical-Professional	Managerial	
1. 0 power items***				
Observed	125	46	28	199
Expected	77.3	48.4	73.3	
2. 1 or 2 guidance items, 1 or 2 social items, 1 power item				
Observed	31	12	17	60
Expected	23.3	14.6	22.1	
3. 0 guidance items, 1 or 2 social items, 1 power item				
Observed	10	17	16	43
Expected	16.7	10.5	15.8	
4. 0 social items, 1 power item				
Observed	14	22	37	73
Expected	28.3	17.8	26.9	
5. 2 power items				
Observed	13	24	85	122
Expected	47.4	29.7	44.9	
Total	193	121	183	497

*   Expected values are based on marginal totals.
**   Because of missing data, some respondents could not be classified into an occupational category.
*** Power items: authority and influence.
    Achievement items: Meaningful work and high expectations.
    Esteem items: appreciation and respect.
    Social items: supportive relationships and sympathetic understanding.
    Guidance items: a clear job and feedback.

Directions for Further Research

Future research could use the five suggested patterns of motivation, or identify some other set of patterns, to investigate the relationship of motivational pattern (as a nominal variable) with other variables. Future research could also investigate the effects of having fewer or having more items in a constrained choice checklist. Additional research could compare summated rating scales and constrained choice checklists.

Conclusion

We have responded to Im and Hartman, who believe that 93 additional hypotheses are needed to test the propositions in our study. Rather than relying on Occam's razor and the principal of parsimony to suggest that a few critical hypothesis tests are sufficient, our response has explained why many of the additional hypotheses are inappropriate. Because *patterns of motivation* were measured with a constrained choice checklist, tests comparing specific needs of IS and non-IS people are inappropriate. As illustrated, however, each participant's responses to the constrained choice checklist can be classified into one of a few patterns of motivation. This nominal variable can be used legitimately in further analyses.

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