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Meaningful Pay Increase?**

**CEO Publication
G 88-12 (125)**

David E. Bowen
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Abstract

This study examined the relationship between different size pay increases and their meaningfulness to employees. As predicted, the results supported that the smallest meaningful pay increase (SMPI) is a constant percentage of current salary, consistent with the psychophysical law. Also, as predicted, the relationship between pay increases and meaningfulness, overall, was found to be curvilinear, and the results indicated the operation of a law of diminishing returns. That is, above SMPI, pay increases continued to increase in meaningfulness, but at a decreasing rate. Implications for pay policy are discussed.

Pay increases will be viewed as rewarding by employees only if they are large enough to be perceived as meaningful (Lawler, 1971). This study considers the degree to which two laws govern the relationship between the size of a pay increase and its perceived meaningfulness. First, does a psychophysical law govern the relationship? The psychophysical law asserts that a just noticeable difference between stimuli on any attribute dimension is some constant function of initial stimulus level (Guilford, 1954). As it has been applied to research on pay, the law maintains that an initial just noticeable difference (jnd) in pay, or the smallest meaningful pay increase (SMPI), is some constant percentage of current pay level. There are inconsistent results for whether such a percentage can be identified, and, if identified, whether it truly remains constant across a range of salaries. (Zedeck & Smith, 1968; Hinrichs, 1969; Krefting & Mahoney, 1977; Futrell & Schul, 1979; Krzystofiak, Newman & Krefting, 1982; Newman, Krzystofiak, & Krefting, 1983; Varadarajan & Futrell, 1984).

Secondly, does a law of diminishing returns govern the size of meaningful pay increases? To date, both research and policy in the area of pay increase meaningfulness have appeared to implicitly assume that the relationship between size of pay increase and extent of meaningfulness is linear. Thus, a pay increase of 10% is assumed to be twice as meaningful as a pay increase of 5%. This study explicitly tests this implicit assumption to determine if a curvilinear relationship may exist and if it reflects a law of diminishing returns. If so, once the initial jnd (SMPI) is exceeded, increases in the size of pay increases (e.g., from 5 to 10 to 15 percent) may not be associated with equal, proportional changes in perceived meaningfulness. Indeed,

additional pay increases may be associated with increases in meaningfulness that occur at a decreasing rate. Thus, the present study examines: (1) whether the smallest meaningful pay increase (SMPI) is some constant percentage of current salary, as predicted by the psychophysical law, and (2) whether the overall relationship between differing size increases and varying degrees of meaningfulness is non-linear, as a consequence of a law of diminishing returns.

Does a Psychophysical Law Govern Pay Increase Meaningfulness?

Prior research on this question has addressed not only whether the psychophysical law (i.e., current salary) can predict the smallest meaningful pay increase but also whether there may be other models that serve as equal or more valid predictors. Specifically, most studies have assessed the smallest meaningful pay increase from some combination of five perspectives (psychophysical; equity; symbolic meaning; hygiene; job inputs/demands):

A psychophysical model deals with the relationship between physical or "objective" changes in a stimulus and the resulting subjective estimates of change in that stimulus. A central concept is the "just noticeable difference" (jnd), which is the "objective" interval between a subject's not sensing the stimulus and then being able to sense the stimulus.

The psychophysical model, applied to pay, identifies the objective point (after a "0" raise) at which a pay increase first acquires perceived meaningfulness, i.e., the smallest meaningful pay increase (SMPI). The psychophysical method can be used to bridge the area of perceptions regarding pay and hard data on actual levels of compensation. Using pay as a "concrete referent" for perceptual data on

satisfaction with pay increases avoids the problems of ambiguity of referent and response bases such as halo and acquiescence that can occur when opinion and satisfaction data are used as referents (Hinrichs, 1968: p. 488).

Furthermore, pay policy typically assumes that the psychophysical law applies. That is, the simplest and most common pay policy is to set some constant percentage of salary as a minimum pay increase on the assumption that equal percentage increases have equal psychological meaning (Krefting & Mahoney, 1977).

The psychophysical law approach to predicting SMPI has received support in a number of studies (Futrell & Schul, 1979; Hinrichs, 1969; Krefting & Mahoney, 1977; Newman et al., 1983; Varadarajan & Futrell, 1984; Zedeck & Smith, 1968) but was not supported in Krzystofiak et al. (1982). Two studies that supported the model, overall, nevertheless reported that SMPI, as a percentage of salary, tended to decrease somewhat at higher salary levels (Futrell & Schul, 1979; Hinrichs, 1969).

The equity theory perspective on SMPI, as described in Krzystofiak et al. (1982) assumes employees might be expected to compare pay raises against some internal standard of fairness (Jacques, 1961) or some external standard (Adams, 1965). The hypothesis tested it that the less equitably treated an employee feels, the higher their SMPI. The equity explanation has been significantly, but weakly, related to SMPI in a small number of studies (Krefting and Mahoney, 1977; Krzystofiak et al., 1982; Newman et al., 1983).

The symbolic meaning perspective involves the employee's orientation toward a pay increase. Pay increases are considered to be

valued either because of their positive impact on the purchasing power of the individual, or because of their significance as a form of organizational recognition (Krefting, 1980; Krefting & Mahoney, 1977). The hypotheses is that different sets of variables best predict SMPI depending on the individual's purchasing or recognition orientation. The symbolic orientation perspective has been supported (Krefting and Mahoney, 1977; Krzystofiak et al., 1982; Varadajaran and Futrell, 1984) and not supported (Newman et al., 1983).

The hygiene perspective assumes that employees with high pay or job dissatisfaction would report larger estimates of SMPI (e.g., Krzystofiak et al., 1982). In Krefting and Mahoney (1977) pay satisfaction had a significant, negative influence on SMPI; while job satisfaction was nonsignificant. On the other hand, in Krzystofiak et al. (1982), job satisfaction was significantly and negatively related to SMPI, while pay satisfaction was not significantly related to SMPI. In Newman et al. (1983), the two satisfaction variables were combined into one scale that was not significantly related to SMPI. Finally, Varadajaran and Futrell (1984) found no significant relationship between pay satisfaction and SMPI; they found job satisfaction to be significantly and positively related to SMPI for employees with a recognition orientation to pay, but it was not significantly related to SMPI for employees with a purchasing power orientation.

The job inputs/job demand perspective hypothesizes a positive relationship between perceived personal job inputs (e.g., age and education) and SMPI; also, there is a hypothesized positive relationship between perceived job demands (e.g., level in the organization) and SMPI (Varadajaran & Futrell, 1984). In the one test of this hypothesis, both

job inputs and job demands were significantly, positively related to SMPI for an organizational recognition subsample, but not for a purchasing power subsample (Varadajaran & Futrell, 1984).

A summary observation of this research is that a limited number of studies have tested different predictors of SMPI with inconsistent results--but the psychophysical law, i.e., current salary, appears to be most consistently associated with SMPI. This pattern of inconsistent results for the other predictors suggests that future research on pay increase meaningfulness should focus on current salary as the most useful referent and treat the personal and situational characteristics consistent with Hinrichs' (1969) past suggestion:

Within the framework of the psychophysical model regarding the perception of salary increases, we perhaps may view these characteristics as analogous to sources of "constant error" such as occur in laboratory studies (p. 489).

Does a Law of Diminishing Returns
Govern Pay Increase Meaningfulness?

Pay policy and SMPI research to date appear to assume that meaningfulness is a linear function of size of pay increase. At a minimum, there is little evidence of salary administrators or researchers explicitly questioning whether the relationship between the size of pay increases and their perceived meaningfulness is linear or curvilinear. This leaves unanswered substantial theoretical and applied questions such as: If 5% is an employee's initial JND--or smallest meaningful pay increase (SMPI)--does that also mean that a 10% increase is viewed as twice as meaningful (a linear relationship) or, is a doubling of the size of the increase associated with less than a doubling of perceived meaningfulness (a curvilinear relationship)? Curiously, an assumption of linearity is in stark contradiction to the

otherwise generally accepted Bernoullian concept of diminished marginal utility for each added dollar.

In a study that investigated this contradiction, Giles and Barrett (1971) investigated whether a linear or non-linear function best fit the relationship between specified merit increases and utility (individual satisfaction). A non-linear relationship could be a function of the decreasing marginal utility of money, which the researchers stated had been found in related social science research by Galanter (1962) and Sellin and Wolfgang (1964). Alternatively, Friedman and Savage (1948) have made a case in economics for the increasing marginal utility of money, when a consumer is shifted into a new class that would give him new social and economic status. This, too, would be a non-linear function.

In the Giles and Barrett (1971) study, the best fit to the data was a non-linear power (increasing) function for pay increases and utility, contrary to the generally accepted principle of diminishing marginal utility. However, for 10% of the employees, more money did not bring more satisfaction, and for some, more money would actually result in a decrease in utility.

Giles and Barrett concluded that it was impossible to draw definitive conclusions about the nature of the relationship between pay increases and their utility, given the relative absence of research on the subject. Instead, they offered their belief that the relationship was likely to be non-linear, ". . . with the increasing or decreasing marginal utility being a function of both the situation and the subjects." (p. 107).

Hypotheses

- (1) Current salary will be consistently associated with SMPI. Specifically, the smallest meaningful pay increase is some constant percentage (K) of current salary, consistent with the psychophysical law.

This hypothesis is based on the relatively strong previous support for current salary as a predictor of SMPI, as well as an interest in trying to predict SMPI through the use of a "concrete referent" i.e., current salary. Testing this hypothesis will offer more evidence on the robustness of the psychophysical law as applied to compensation. That is, support for the hypothesis would further indicate that the study in which the law was not supported (Krzystofiak et. al., 1982) can be regarded as an exception. Also, the results can clarify whether there is, or is not, a tendency for K to decrease as current salary increases, as found in two previous studies (Hinrichs, 1969; Futrell and Schul, 1979).

- (1a) Variance in individuals' perceptions of a smallest meaningful pay increase (SMPI) may be explained by personal and situational variables, including: job satisfaction, pay satisfaction, pay equity, job inputs, and job demand.

Once an average SMPI is identified for employees' overall, variance in employees' perceptions of the meaningfulness of that given increase may be explained by various personal and situational factors that can be regarded as sources of "constant error," borrowing from Hinrichs.

- (2) The overall relationship between alternative sizes of pay increases and their perceived meaningfulness is non-linear and this non-linear relationship will indicate that a law of diminishing returns holds.

This hypothesis is consistent with the logic of the decreasing marginal utility of money and tests whether, beyond SMPI, increases in the size of a pay increase are associated with increases in

meaningfulness occurring at a declining rate. Testing this hypothesis responds to Giles and Barrett's (1971) call for research (long-ignored) on the nature of the relationship between pay increases and their utility and how this relationship may vary across differing work contexts.

In sum, hypotheses (1) and (2) predict that: (a) the initial JND that establishes the lower threshold of meaning for employees (SMPI) can be expressed as a constant percentage increase over current salary that yields approximately the same psychological meaning for all employees, but that (b) once the lower threshold has been exceeded, additional incremental percentage increases over current salary may result in decreasing increments of meaningfulness for employees. In other words, the study examines not only what is a JND in a salary increase, but what is the size of the next JND keeping the starting point, current salary, the same.

Method

Subjects

The sample consisted of the geographically dispersed field salesforce of a major appliance manufacturer headquartered in the Midwest. Of 679 surveys mailed, 639 were returned, for a response rate of 94%. Two reminders to complete and return the survey were used. Anonymity was guaranteed. The average age of the salesforce was 46.64, with a standard deviation of 9.70. The average years of service was 17.49, with a standard deviation of 8.96.

The salesforce was told that their survey data would be an important consideration in corporate management's decisions about possible changes in the bonus programs included within their

compensation plan. Although the sales force was generally satisfied with the bonus programs themselves, (e.g., only 12% agreed with an item that asked if bonus programs should be held less frequently), interview data indicated dissatisfaction with the size of the bonuses. The bonuses, as a percentage increase in pay, often were not perceived as large enough to be meaningful.

Measures and Procedure

Estimating the size of a meaningful pay increases. Data on the dependent variable, extent of interest in a pay increase, was collected with a survey item that asked, "If a bonus program were announced which offered a ____% increase in pay, to what degree would you be interested in finding out about it?" (The item was worded in this way to minimize the demand characteristics that would likely have been associated with transparently asking respondents how large they would like their bonuses to be.) The response format was from 1 = Not at All, to 7 = To a Very Great Extent. The alternative increases appearing in the blank were: 2, 5, 10, 15, and 20 percent. Each salesperson responded to only one of the alternatives. Five different versions of the survey were printed, differing only according to the percentage appearing in the blank, and then the different versions were randomly distributed across respondents. That is, individuals were randomly assigned to a particular treatment group, i.e., percent increases.

This methodology is based on an adaptation of the Methods of Limits, a method that deals with the concept of thresholds and determines the amount of proportionate meaningful increases (K) to base salary (Woodworth & Schlosberg, 1954). Variations of this methodology were used in Zedeck and Smith (1968), Hinrichs (1969), and Giles and

Barrett (1971), all of whom listed in survey form a number of alternative salary increases (in absolute dollars), and had employees rate them on their perceived equity, size, i.e., small to large, or utility.

The present procedure of estimation, however, avoids the methodological limitations that existed in these three earlier studies when each respondent was able to first consider all possible pay increases, and then indicate the relative meaningfulness of each. The limitation was that when all possible increases appear on the survey, the respondent can first ". . . scan the questionnaire, familiarize himself with the levels, and then, with the aim of being consistent, fill in his responses" (Zedeck & Smith, 1968: p. 346). Giles and Barrett (1971) concede the same problem in their study, noting that ". . . in responding to a questionnaire of this type [employees] might attempt to order the merit increases in ascending values and adjust their responses accordingly" (1975: p. 108). In other words, respondents may provide ratings of the meaningfulness of increases that reflect their interest in being consistent, more so than reflecting their perceived meaningfulness of any given pay increase, per se. To avoid this problem, Giles and Barrett suggested presenting each increase on a separate sheet of paper or a projector.

The present procedure overcomes this methodological problem in a logistically simple manner. The procedure yielded large subgroups for each percentage increase (2%, N = 129; 5%, N = 128; N = 124; 10%, N = 122; 20%, N = 124). Each subgroup yields a perception of the meaningfulness of a particular pay increase, unaffected by a need to be consistent with their responses to other increases. And given subjects

were assigned to groups randomly, the overall perceptions can yield the range of meaning these increases hold for the typical employee.

Independent Variables. Salary was obtained from company records. The company provided the range within which each salesperson's salary fell and this data was matched to their completed surveys. The modal salary was between 35,000 and 40,000 dollars and corresponded with a coded salary level of 4. Gathering objective salary data in this manner averted common method variance problems with respect to testing the psychophysical law.

Insert Table 1 About Here

The remaining independent variables were measured as: "Job Satisfaction" and "Pay Satisfaction," and were measured with scales from the Michigan Organizational Assessment Questionnaire (MOAQ) (Cammann, Fichman, Jenkins & Klesh, 1983), with reliabilities of .68 and .89, respectively. "Pay Equity" combined two MOAQ scales, internal equity, i.e., fairness in pay relative to others in the company, and personal equity, i.e., fairness relative to one's own assessment of the job she/he is doing, to yield the overall equity scale with a reliability of .80.

"Job Inputs" combined age, months-in-level, and years service into one scale with the reliability of .77. "Job Demand" was operationalized by grade level in the organization.

Analysis. Hypothesis 1 was tested with hierarchical regression (Cohen & Cohen, 1983), in which independent variables or sets of independent variables are entered into the equation based on the logic of the theory being tested. The psychophysical law implies that extent

of the interest will be some constant function of current salary. In statistical terms, "some constant function" suggests that interest and current salary are uncorrelated after accounting for the effect of the size of the increase. Thus, a two step hierarchical regression is performed. In step 1, extent of interest is regressed on the size of the increase. In the second step, the respondent's current salary is entered. Any increase in R^2 is the unique relationship between current salary and extent of interest. A non-significant increase in R^2 in this step confirms the hypothesis.

Hypothesis 1a was tested with the simultaneous regression model in which independent variables or sets of independent variables are entered into the equation together. In Hypothesis 1a, extent of interest is simultaneously regressed on all six individual and situational variables. The importance of any one variable in explaining extent of interest in SMPI is determined by the conventional t-test of the regression coefficient.

Hypothesis 2 is also tested hierarchically. In this case, the size of the increase, percent of current salary, is used in three different forms: singularly, squared and cubed. Each form of increase is entered, one after the other, to represent the linear, quadratic and cubic trends, respectively. Significant deviations from linearity are again determined by the size of the increase in R^2 .

Results

Descriptive statistics and intercorrelation matrix for the dependent and independent variables are shown in Table 2.

Insert Table 2 About Here

In the hierarchical test of hypothesis 1, the regression of extent of interest on percent increase (Step 1) was significant as expected. The larger the percent increase, the larger the extent of interest in the bonus program. By itself, the size of the increase accounted for almost 28% of the variance in extent of interest.

Insert Table 3 About Here

In the second step, the increment in R^2 indicates that salary is not significantly correlated with extent of interest once the size of the increase has been accounted for. This means that the extent of interest in a given percentage increase does not vary significantly, regardless of employees' salary, thereby confirming the psychophysical law. (While the equation remains highly significant, it is not due to the effect of current salary).

To further verify that salary has no direct or indirect impact on extent of interest, the interaction of salary and percent increase was entered. The non-significant interaction term confirms that not only is salary a non-significant main effect, its joint effect with percent increase is meaningless. Additionally, Table 4 presents the extent of interest means for each cell in a salary-by-percent increase matrix. As can be seen, there appears to be little variance in means down the columns of each percentage increase, i.e., interest in a given increase does not vary by salary level. Any exceptions to this are found primarily in salary ranges 6-8 in which there are only an isolated few employees for each cell (Refer again to the salary distribution in Table 1).

Insert Table 4 About Here

In sum, the data generated by our alternative methodology provides strong support for the first hypothesis and the psychophysical law. Extent of interest in particular pay raises appear to be some constant function of current salary.

As a next step, is it possible to estimate which percentage increase (K) is the smallest meaningful pay increase? That is, is 2, 5, 10, 15 or 20% the "just meaningful difference" (jnd) for employees?

SMPI can be inferred from the data, if not identified as explicitly as in earlier studies that simply asked respondents to directly state their personal SMPI (the respective merits of these two different ways of operationalizing SMPI will be dealt with in the discussion). Five percent appears to be the smallest meaningful pay increase based on:

- The plot of extent of interest in alternative percentage pay increases in Figure 1 shows that interest in a 2% increase is sharply lower than the interest in increases of 5% and above.
- The mean response to a 2% increase is only 3.15 or "to some extent" on the 7-point extent of interest scale. Moving to a 5% increase results in the largest gain (an increase of 1.40 in mean interest) across any two consecutive levels and results in a 4.55 mean extent of interest, crossing the midpoint of the extent of interest response scale.
- A Scheffe test of the significance of differences in means (Table 5) indicates that: (a) extent of interest in a 2% increase was significantly less than extent of interest in a 5, 10, 15, or 20% increase; and (b) extent of interest in 5% increase is not significantly different from a 10% increase. Pay increases appear, then, to change from being not-meaningful to meaningful in the move from 2% to 5%.

Insert Table 5 About Here

Hypothesis 1a explored the individual differences and situational variables that have been used to predict SMPI in prior studies. This was done by treating 5% as the SMPI for the sample (based on the above results), and then examining which variables would significantly explain the variance in extent of interest expressed by employees in the 5%, SMPI, subgroup. Extent of interest (in a 5% raise) was regressed on the following set of variables using the simultaneous model: level in hierarchy, job satisfaction, inputs, pay satisfaction, salary and equity.

The predictors, as a set, did explain a significant amount of variance in extent of interest (Table 6) but only pay satisfaction emerged as a significant individual contributor. (Note: a non-significant salary coefficient means that it does not explain variance in extent of interest which, to repeat, means the psychophysical law holds.)

Insert Table 6 About Here

The second hypothesis, that a curvilinear relationship may exist between the size of a pay increase and extent of interest, was tested next. [Note: Because hierarchical regression was used here, it should be noted at the outset that we are not "curve fitting" or attempting to discover the exact form of the equation which best fits the data. Rather, we are attempting to determine (1) if the data deviates from linearity, and (2) what component trend seems to best describe the data.]

The results of the regression analysis are shown in Table 7.

Insert Table 7 About Here

The linear trend is significant ($R^2 = .297$, $p < .001$), but the addition of a quadratic term increases explained variance by just under two percent and also represents a significant trend. The cubic trend is not significant, representing only about a .3% increase in explained variance.

The sign of the quadratic (squared) term is negative and significant. This indicates that extent of interest increases at a decreasing rate across the range of percentage increases included in the sample. This conclusion is supported by a visual inspection of the plot in Figure 1.¹

Thus, the relationship between extent of interest and percent increase is non-linear, supporting Hypothesis 2. The shape of the function appears to be best described by a power decreasing, quadratic curve. At low increase levels (2% in this case), extent of interest is relatively low (3.1 out of 7), increases quickly between 2, 5, and 10% (from 3.1 to 4.5 to 5.1), but at a decreasing rate. Between 10% and 20%, interest only increases from 5.1 to 6.2, an amount considerably less than the increase between 2% and 5% (1.1 over 10 points vs. 1.4 over 3 points). Extent of interest rises quickly with each increase between 2% and 5%, but then rises much more slowly between 10% and 20%.

In sum, respondents indicate that further increases, while interesting and valuable, are worth "less" per unit than the initial increase.

¹ The analysis yields an equation with relatively small overall standard error and individual coefficient standard errors that are relatively small and stable. The Q-Q' plot of residual values appears normal. In addition, a cross validation process was used by randomly splitting the sample in half and running the same analyses. The results of the two analyses under each condition were highly similar. As a result, confidence that the observed trends do, in fact exist, appears high.

Discussion

Overall, these results confirm that both the psychophysical law and the law of diminishing returns govern the relationship between the size of a pay increase and its perceived meaningfulness. The initial "just meaningful difference" of a pay increase, or SMPI, was some constant percentage of current salary. This means that a given percentage increase will have the same psychological meaning for employees, regardless of their current salaries. However, additional and equal percentage increases beyond this lower threshold are not associated with equal proportional increases in perceived meaningfulness. Instead, this relationship was curvilinear. The data suggest that beyond SMPI meaningfulness continues to increase, but at a decreasing rate, supporting a law of diminishing returns.

These results need to be discussed further relative to: (1) the applicability of the psychophysical law to SMPI, (2) specification of the overall relationship between size and meaningfulness, and (3) implications for pay policy.

The Psychophysical Law and SMPI

The results support other studies which found current salary to be a significant referent for SMPI (Zedeck & Smith, 1968; Hinrichs, 1969; Futrell & Schul, 1979; Newman, Krzystofiak & Krefting, 1983; Varadarajan & Futrell, 1984). However, the present results do not confirm the finding that SMPI, as a percentage, decreases somewhat as salary increases (Hinrichs, 1969; Futrell & Schul, 1979). This difference may reflect that the salary distributions used in these earlier studies were very different from the salary distribution in the present study. In the earlier studies, salary levels in the middle of the distribution

were based on far more narrow intervals than were salary levels at the upper end of the distribution, which were very broad; also, employees were rather equally spread across the levels. In the present study, all nine levels were based on equal intervals of \$5,000 and 75% of the employees fell in the three mid-range levels. These characteristics of the present salary distribution meant that this study did not test the applicability of the psychophysical law at the extremes of salary ranges to the same extent as the earlier studies.

The fact that salary was obtained from company records in this study, as opposed to self-reported in all the other studies, may also lend power to finding a constant percentage because it guarantees the validity of the salary data used in the denominator. Self-reported salary data may be inaccurate, due to incomplete knowledge or falsification. With respect to the latter, Krzystofiak, Newman and Krefting (1982), who did not confirm the psychophysical law, obtained their data from a post-graduation follow-up of business school alumni, some of whom may have been tempted to exaggerate their current level of earnings. Alternatively, archival data guarantees that salary is, indeed, a "concrete referent."

The strength of the psychophysical law in the present sample may also be partly explained by the finding that as the experience of the workforce increases, salary has an increasingly strong relationship with SMPI (Newman et al. 1983). The salesforce in this study had an average of 17 years with the company, allowing the formation of very unambiguous expectations regarding their salary levels and the smallest meaningful pay increases.

Although these results indicate that the psychophysical law is clearly appropriate for understanding SMPI as a constant percentage of current salary, the law is inappropriate for considering an important future research question: How do employees experience pay increases below the lower threshold of meaningfulness? When the psychophysical law is applied to physical relationships such as increasing the intensity of light until it is visible to the subject, then the dependent variable, visibility, is dichotomous: You do not see it at all, and then you do. However, the relationship between increases in pay and meaningfulness as a dependent variable is clearly a different phenomenon. The "non-meaningfulness" range is perceived by the subject/employee in some manner that requires definition and scaling. That is, are increases below SMPI alienating, frustrating, annoying--but still desirable?

This question is totally ignored in the more recent studies which treated SMPI as a dichotomous variable, consistent with the psychophysical law, but inconsistent with the true continuous nature of the phenomenon (Krefting & Mahoney, 1977; Futrell & Schul, 1979; Krzystofiak et al., 1982; Newman et al, 1983; Varadarajan & Futrell, 1984). Although the present study, unlike others, did assess employee perceptions of pay increases below SMPI, i.e., 2% (and respondents did indicate some interest in even that increase), a richer understanding of their evaluations could have been gained by a more complex scale for evaluating the "meaningfulness" of pay increases (e.g., ranging from very offensive, to neither offensive nor rewarding, to very rewarding).

Relative to hypothesis 1a, explaining variance in SMPI based on individual and situational characteristics, the test of predictors of

extent of interest in a 5% increase (SMPI) yielded only one significant predictor. At SMPI, pay satisfaction is a positive contributor to extent of interest, uniquely accounting for about 4% of the variance. Other things being equal, the more people are satisfied with their pay, the more interested they are in an increase. However, the fact that pay satisfaction was significant, but job satisfaction was not, adds to the previous pattern of inconsistent results for the hygiene perspective on SMPI.

In all, the results for hypotheses 1 and 1a support the approach of using salary as the principal referent for SMPI and treating the perceptual referents as sources of constant error. However, it should at least be mentioned that the test of hypothesis 1a may have been limited by there being less variance in the dependent variable, i.e., extent of interest in one particular size increase, than would be the case for SMPI in other studies. Also, the data did not permit sub-grouping the sample by orientation to pay which has in some, but not all, studies provided the clearest picture of the role these predictors play. However the shortcoming of not having symbolic orientation data is somewhat offset by the likelihood that these orientations are not very stable anyway (Krefting, 1980) and that they may offer little practical guidance to pay policy (Krefting, Newman, & Krzystofiak, 1987).

Specification of the Overall Relationship Between Size and Meaningfulness

This study's examination of perceptions of meaningfulness of pay increases above SMPI extended the earlier work of Zedeck and Smith (1968), and Hinrichs (1969). However, the test of whether the relationship between pay increase size and meaningfulness is linear or

non-linear can only be compared to Giles and Barrett (1971), who found the relationship to be non-linear with utility constantly increasing, at an increasing rate, except for 10% of their sample. The present results also indicate a deviation from linearity, but with utility increasing at a decreasing rate.

As Giles and Barrett (1971) observed, the form of the relationship between pay and utility needs to be considered in a specific context. Giles and Barrett (1971) found increasing marginal utility in a company they described as a ". . . relatively young, fast growing, technically based organization" (p. 108). However, they also found that 10% of the employees reported decreasing utility:

. . . there was a point reached where a larger merit increase gave cause for worry. The worry expressed was related both to the feeling that a very large increase would be unearned and that there would be performance expectations that could not be met.

They hypothesized that in an older, more conservative firm, large salary increases would evoke more feelings of inequity and risk, since a large salary increase might imply an expectation of higher job performance that the individual could not meet. The present sample fits that description (large, conservative, long-tenured, older employees), and may explain why extent of interest rises at a decreasing rate at the higher pay increases.

The results also suggest that this decreasing rate evidences itself in the form of the "jnds" in pay increases that exist after the initial jnd, i.e., SMPI. The present data indicate that a 20% increase does not yield a significantly greater return than a 15% increase. Furthermore, the Scheffe results indicate that employees do not view a 15% increase as significantly more meaningful than a 10% increase (Table 5).

Moreover, at some point between 5% and 10% the extent of interest in the increase already exceeds a "large extent of interest" (the anchor for 5 on the scale). This supports a law of diminishing returns from even higher increases and that there may be no need theoretically, and certainly practically, to examine employee responses to higher increases. A next jnd does exist at 15%, but this size increase is higher than many organizations can pay and it also can be viewed as falling within the range of diminishing returns, given the large interest in lower increases. In sum, there may be multiple thresholds and jnds in the relationship between pay increase size and meaningfulness, so that increases that fall between thresholds may not be perceived as significantly more meaningful than pay increases at the threshold below it.

Finally, a limitation in this study was not having a "no treatment" or 0% bonus group. (The client naturally saw this as a rather absurd question to pose). By not including a "no treatment" group, we had only one point below SMPI and were therefore unable to know if interest increased at an increasing, linear, or decreasing rate. If interest increased at an increasing rate below SMPI, but increased at a decreasing rate above SMPI, then the relationship between interest and pay increases would follow the familiar s-shaped curve.

Implications for Pay Policy

The present results support the validity of setting some constant percentage of current salary as a minimum pay increase on the assumption that equal percentage increases have equal psychological meaning. In other words, when pay policy implicitly assumes that the psychophysical law holds, the policy is supported by the research. Alternatively these

results do not support pay policies which are based on the assumption that the more money an individual makes, the larger a percentage increase in salary must be for the increase to be perceived as meaningful. This is a pay policy that Futrell and Schul (1979) have observed in-practice. Indeed, Hinrich's (1969) data fit this very pattern at the upper end of the distribution. The present data support that a given % SMPI will be constant across the full range of current salaries.

The lack of support for individual and situational predictors of SMPI may actually be comforting to pay administrators. Indeed, employees, as a group, would be unlikely to accept pay increases tailored to each individual's particular perceptual profile on equity, symbolic meaning, hygiene and job inputs/job demands dimensions:

Employees are not likely to accept these variations in the size of their pay increases as fair; pay increases are expected to be related to organizational contribution not to idiosyncratic perceptions. The design of a feasible yet fair pay policy that sets minimum pay increases roughly equal to SMPI for each individual seems virtually impossible (Krefting & Mahoney, 1977: p. 92).

Additionally, even when prior research established more significant relationships between these perceptual referents and SMPI, the results did not offer clear guidance to pay administrators. For example, Krzystofiak et al. found that:

People with a recognition orientation who have larger typical/personal salary increases and are dissatisfied with their pay but satisfied with their jobs have larger smallest meaningful pay increases (1982: p. 661).

In sum, it may be both undesirable and impossible to tailor the size of pay increases to fit these idiosyncratic variables.

Given the difficulty of accounting for these considerations, pay policy might do best to specify some dollar amount for the minimum

increase based on an amount that would be meaningful to most employees-- "a type of highest common denominator" (Krefting & Mahoney, 1977). The present results support specifying that dollar amount as a percentage, K, of current salary that would yield roughly the same psychological meaning for employees, regardless of differences in current salary.

Finally, organizations must strike a balance between the meaningfulness provided by indeed offering the full SMPI to employees and the cost of such a policy. The implications of alternative resolutions of this tradeoff will depend on the behavioral and organizational consequences of meaningful and nonmeaningful pay increases, an important focus for future research (Krefting & Mahoney, 1977). Certainly, there is a need to better understand the potential consequences of nonmeaningful pay increases, given many "merit" pools are less than 5% of salaries. Indeed, one might argue that most of the tension between employer and employee over pay administration is worked out below SMPI.

The difference in the overall relationship between pay increases and their perceived meaningfulness for this sample of employees, versus those in Giles and Barrett (1971), indicates the desirability of mapping the wage curves (Zedeck & Smith, 1968) or utility functions (Giles & Barrett, 1971) in operation for any specific company. That is, how would these curves vary according to employee characteristics or pay administration practices, e.g., seniority versus performance-based pay? More broadly, how are both SMPI and wage curves/utility functions affected by inflation market movement? In other words, these results can shift across economic times.

Lastly, the presence of a Law of Diminishing returns makes it even more difficult to administer meaningful merit increases. For example, in low inflation times, employees may receive an approximately 5% COLA increase, which is likely to constitute an acceptable SMPI. However, if the employer then adds another 3-5% merit increase, the present data suggests that this would not be associated with a significantly greater amount of perceived meaningfulness for the employee over the initial COLA increase. Indeed, the next jnd for a significant increase in meaningfulness may be as high as an additional 10%! In all, employees may value two 5% increases given at different times, where each is perceived as significantly meaningful, more so than one approximately 10% increase, which is not significantly more meaningful than a 5% increase.

In summary, both a psychophysical law and a law of diminishing returns appear to govern the size of meaningful pay increases. These results will hopefully encourage future research to focus not only on just the smallest meaningful pay increase (SMPI), but to also focus on the nuances of the relationship between a range of alternative size increases and the varying degrees of meaningfulness associated with them.

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Table 1
Frequency Distribution of Salary Levels

Salary Range (Dollars)	Code	N
20,000 - 24,999	1	11
25,000 - 29,999	2	46
30,000 - 34,999	3	132
35,000 - 39,999	4	174
40,000 - 44,999	5	146
45,000 - 49,999	6	74
50,000 - 54,999	7	15
55,000 - 59,999	8	3
60,000 - 64,999	9	1

Table 2

Descriptive Statistics and Correlation
Matrix for All Variables

Variables	Mean	S.D.	1	2	3	4	5	6	7	8
1. Salary Level	4.1	1.3	-	-02	-02	11*	24**	30**	87**	-02
2. Size of Increase	10.35	6.6		-	-07	-12**	-11*	05	00	53**
3. Job Satisfaction	5.7	0.9			-	30**	33**	17**	-03	09*
4. Pay Satisfaction	3.5	1.4				-	83**	05	09*	02
5. Pay Equity	3.5	1.2					-	08*	21**	05
6. Job Inputs	44.7	23.1						-	24**	-03
7. Job Demand	9.6	1.3							-	00
8. Extent of Interest	4.9	2.0								-

* p < .05

** p < .01

Table 3

Results of a Hierarchical Regression of Extent
of Interest in a Pay Raise on Size of the
Increase and Current Salary (a)

Step	Percent Increase	Current Salary	Interaction	R ²	R ² Change
1	.16*** (.01)	--	--	.277***	---
2	.16*** (.01)	.02 (.05)	--	.278***	.001 (NS)
3	.18*** (.03)	.05 (.09)	-.00 (.01)	.278***	.000 (NS)

*** p < .001

(a) Results reported include the unstandardized regression coefficients and standard error (in parentheses).

Table 4

Average Extent of Interest (Cell Means)
in a Pay Raise by Percentage Increase
and Salary Level

Salary Level	Percentage Increase				
	2	5	10	15	20
1	4.5	3.0	6.5	4.0	5.0
2	3.2	3.4	5.0	5.8	6.6
3	3.7	4.7	4.7	6.0	6.0
4	2.6	4.6	5.2	5.8	6.6
5	3.1	4.0	5.1	5.9	6.6
6	2.7	4.9	5.5	5.7	6.6
7	4.0	6.2	4.0	NA	5.8
8	4.0	2.0	NA	6.0	NA
Column Mean	3.1	4.5	5.1	5.8	6.2

Table 5
Means, Standard Deviations and Significant
Differences (Scheffe Test) for Extent
of Interest by Salary Increases

Group	Salary Increase %	Extent of Interest (a)		N	Significant Differences
		Mean	S.D.		
1	2	3.15	1.93	129	1 < 2,3,4,5
2	5	4.55	1.94	128	2,3 < 4,5
3	10	5.11	1.80	124	3,4 < 5
4	15	5.84	1.41	122	No difference
5	20	6.24	1.41	124	

(a) Extent of Interest was measured on a 7 point scale which ranged from (1) Not at all to (7) To a very great extent.

Table 6

Comparison of Individual and Situational
Variables in Explaining Extent of
Interest in a 5% Pay Increase (a)

Variable	B	Std. Error	Significance
Job Demand	-.03	.25	NS
Job Satisfaction	.02	.22	NS
Job Inputs	.00	.01	NS
Pay Satisfaction	.62	.29	.03
Salary	.09	.24	NS
Equity	-.14	.35	NS

(a) Overall R = .15; p = .02

Table 7

Comparison of Linear, Quadratic and Cubic Trends
in Explaining Extent of Interest

Step	Linear (a)	Quadratic	Cubic	R
1	.53/.16*** (.01)	---	---	.277***
2	1.1/.33*** (.05)	-.56/-.01*** (.002)	---	.294***
3	1.7/.55*** (.15)	-2.2/-.03* (.02)	1.0/.0007 (b) (.0005)	.297***

(a) Reported results include standardized/unstandardized regression coefficients and standard errors (in parentheses).

(b) The cubic trend does not reach significance at the $p = .05$ level ($p = .14$).

FIGURE 1
 PLOT OF EXTENT OF INTEREST AGAINST
 PERCENT INCREASE FOR DIFFERENT SALARY LEVELS

