

## Are Higher Pay Increases Necessarily Better?

Mayuri Bhakta and Mark S. Nagy  
Xavier University

*This study investigated the relationship between pay increase percentages and pay satisfaction among 118 MBA students and found that pay satisfaction had the largest increase between three percent and seven percent and appeared to level off between seven percent and eleven percent, suggesting that there may be a point at which high pay increases may not necessarily lead to more satisfaction. In addition, it was found that pay increases between six and eight percent are the minimum amounts needed for pay increase satisfaction. Finally, we suggest that employees may not need as high of a pay increase to experience satisfaction with their pay increase when providing those employees with a signal, such as an average pay increase.*

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A key component for a successful organizational intervention is the meaningfulness of the intervention to the employee. One intervention that may be meaningful to many employees is the amount of their pay increase. For a pay raise to serve a purpose, it must be noticed and meaningful to the employee. One possible method to detect the usefulness of a pay raise may be through the use of psychophysical techniques, which focus on the process involved in detecting and making decisions about sensory experiences. Whereas psychophysical techniques have been widely used to assess sensory perception, they have also been used to assess the meaningfulness of pay increases (e.g., Rambo & Pinto, 1989; Champlin & Kopelman, 1991; Worley, Bowen & Lawler, 1992; Mitra, Gupta & Jenkins, 1997).

Yet, a potential limitation of classic psychophysical techniques, such as the identification of just noticeable differences (JND) or just meaningful differences (JMD), is that they refer to a single absolute threshold. On the other hand, signal detection theory identifies two distinct processes in sensory detection. That is, signal detection theory focuses not only on sensory processes, but the process of making judgments and decisions about the presence and absence of stimulus events (Zimbardo, 1992). When applied to reactions to pay increases, signal detection theory may be used to compare differences in the perception of a pay increase between individuals and how an individual views his/her pay increase. By quantifying this type of information, researchers and practitioners may be able to identify the optimum level of a pay increase employees will need to experience in order to improve their satisfaction with a pay increase.

The rationale behind signal detection theory is that any stimulus produces some cognitive thought that deciphers the importance of the stimulus. To decide whether the stimulus is important, the observer compares the stimulus to a personally set criterion (Zimbardo, 1992). If the response of the process is greater than the criterion amount, then the participant responds “yes” to witnessing the signal. If the response is less than the criterion amount, the participant responds “no” to witnessing the signal. According to Kadlec (1999), if the participant decides that the

stimulus is equal to or greater than the criterion of which the signal is compared, then the stimulus is judged to be a signal. However, if the participant decides the stimulus is less than the criterion of comparison, the stimulus is irrelevant and the stimulus is judged to not be a signal.

Applying this principle to employee reactions to pay increases suggests that there may be an analogous threshold in pay satisfaction evaluations, such that when the amount of the stimulus (i.e., the amount of pay increase) exceeds a certain level, a positive decision will be made regarding the participant's satisfaction with the stimulus, whereas if the amount of the stimulus (such as pay increase) fails to reach a certain level the participant will be dissatisfied with (or at least unaffected by) the stimulus.

In signal detection theory, a measure of a participant's performance, beta, represents the participant's criterion based on the information created by the stimulus. The criterion, or beta, is a comparison between an individual to an ideal person, which is one who correctly identifies all hits and correct rejections (Sekuler & Blake, 1990). Interestingly, this process of comparison between an individual to another may be used to explain how criteria develop within an individual and how these criteria influence employee reactions to organizational interventions, such as pay increases. That is, comparisons with others may help enable employees to assess their own strengths and weaknesses to evaluate the rewards that are entitled to them.

One theory that describes a method for developing criteria through comparisons with others is equity theory (Adams, 1965). Equity theory states that an individual compares his/her own ratio of outcomes to inputs to another person's ratio of outcomes to inputs in order to determine if he/she is satisfied with a situation (Adams). One of the common outcomes often referred to in equity theory is pay. Research has shown that both getting less than you want and getting more than you want leads to large discrepancies between desires and outcomes and eventually leads to low job satisfaction (Rice, Bennett, & McFarlin, 1989). Hence, desires play an important role in assessing if increasing income impacts an individual's job satisfaction. Moreover, if the desires of the individual are already met, then an increase in income will not increase satisfaction (Solberg, Diener, Wirtz, Lucas, & Oishi, 2002). In other words, increasing wages may not always lead to job satisfaction.

Interestingly, this notion that increasing wages may not always lead to increased pay satisfaction has been demonstrated in several studies. For instance, Sweeney (1990) found a curvilinear relationship between perceptions of equity and pay level satisfaction in that employees had lower satisfaction when they believed their pay was less than they deserved and more than they deserved. In other words, employees perceiving that they were overpaid did not necessarily lead to higher levels of pay level satisfaction. Moreover, Rambo and Pinto (1989), Champlin and Kopelman (1991), and Worley et al. (1992) all found that positive reactions to pay increases were not as great between higher pay increases (e.g., 15% and 18%) as they were between lower pay increases (e.g., 2% and 5%).

To date, however, most of the research investigating reactions to pay increases has utilized a just noticeable difference (JND) or a just meaningful difference (JMD) approach. In these studies, an absolute threshold is identified

wherein employees will change their evaluation of a pay increase (Rambo & Pinto, 1989; Champlin & Kopelman, 1991; Worley et al., 1992; Mitra et al., 1997). In particular, most of this research has involved participants indicating what pay increase percentages are associated with certain evaluations. For instance, a participant may indicate that a 2% pay increase will be somewhat disappointing, whereas the same participant might indicate that a 5% pay increase would evoke a neutral evaluation. By taking an average across a range of different reactions (e.g., from *deeply disappointed* to *being flabbergasted*), the researcher is able to determine the pay increase “threshold” that must be eclipsed in order to alter an evaluation of the pay increase. Whereas it is certainly helpful to know the threshold level that is likely to result in different pay increase reactions, the curvilinear findings from the aforementioned studies suggest that these thresholds may not be consistent across a wide range of pay increases. Instead, the curvilinear results suggest that these thresholds may shrink at higher levels of pay increases.

Because these thresholds may not be consistent across a range of pay increase levels, the presence of the curvilinear relationships between pay increases and positive employee reactions suggest that there may be a point at which positive employee reactions will be maximized, and that additional increases in pay will not be equivalent to additional increases in employee reactions. In fact, this outcome is similar to the economist notion of decreasing marginal utility in dollars in that employees may become less sensitive for every additional dollar included in a pay increase (Giles & Barnett, 1971). Thus, it may be plausible to use signal detection theory to identify the point at which the percentage of a pay increase maximizes positive employee reactions, or at least a percentage at which further pay increases represent a point of diminishing returns. Therefore, the following hypothesis is suggested:

*H1: The relationship between a pay increase and pay satisfaction is curvilinear such that there is a point at which pay satisfaction asymptotes and remains constant.*

In extending the psychophysical research on reactions to pay increases, another purpose of this study is to identify the exact point where pay satisfaction asymptotes. Specifically, Katkowski, Medsker, and Pritchard (2002) identified a just noticeable difference estimate for pay increases ranging from six percent to eight percent of current salary level. Moreover, Mitra et al. (1997) found that pay increases below seven percent are not likely to result in positive attitudinal reactions, whereas Worley et al. (1992) estimated that pay increases between five and ten percent were likely to evoke positive employee reactions. When considered together, the results of these studies suggest the following hypotheses:

*H2a: Employees will be more satisfied with a pay increase between six to eight percent than they will be with a pay increase of less than six percent.*  
*H2b: Employees will not be more satisfied with pay increases above eight percent than they are with pay increases between six to eight percent.*

## Method

### Participants

One hundred eighteen MBA students from a Midwestern university completed a survey consisting of seven items. Participants were between the ages of 21 and 50, and included 81 men (68.6%) and 36 women (30.5%). Current salaries of the participants ranged from \$0 to \$110,000, with the range from \$40,001 to \$50,000 being the most frequently reported (22%; see Table 1). Participation in this study was voluntary and names were not collected to ensure the anonymity and confidentiality of the participants.

### Measures

*Pay increase satisfaction.* Participants completed a three-item questionnaire asking them to make judgments on their satisfaction with pay increases of three, seven, and eleven percent. Participants rated their satisfaction with the individual pay increases on a 5-point Likert-type scale ranging from *very dissatisfied* to *very satisfied*.

*Minimum pay increase.* An additional question was included to assess minimum pay increase satisfaction. Participants were asked one open-ended question regarding the minimum percentage pay increase with which they would be satisfied.

### Procedure

Participants were randomly divided into two categories: those who received a questionnaire with a “strong” condition, and those who received a “weak” condition. The “strong” condition consisted of providing an annual salary from which the respondent could use when evaluating satisfaction with a particular pay increase.

**Table 1**  
**Frequency and Percent of Participants' Reported Salaries**

Salary Range	Frequency	Percent
\$0- \$20,000	10	8.5
\$20,001 - \$30,000	2	1.7
\$30,001-\$40,000	19	16.2
\$40,001-\$50,000	26	22.2
\$50,001-\$60,000	14	12.0
\$60,001-\$70,000	18	15.4
\$70,001-\$80,000	12	10.3
\$80,001-\$90,000	6	5.1
\$90,001-\$100,000	3	2.6
\$100,001-\$110,000	3	2.6
\$110,001-\$120,000	4	3.4

Specifically, participants in this group were told their hypothetical annual salary was \$65,000, which was the median starting salary listed on the participating university's MBA website and was widely publicized to students. Participants were further asked to make judgments about their satisfaction with various hypothetical pay increases. As an example, participants in the "strong" condition were told that their annual salary was \$65,000 and then asked, "How satisfied would you be if your annual pay raise was \_\_\_\_\_ (a certain percentage)?" These percentages were three percent, seven percent, and eleven percent. The pay increases were presented in random order, such that one-third of the participants received 3% first, another third received the questionnaire with 7% first, and the last one-third received 11% first.

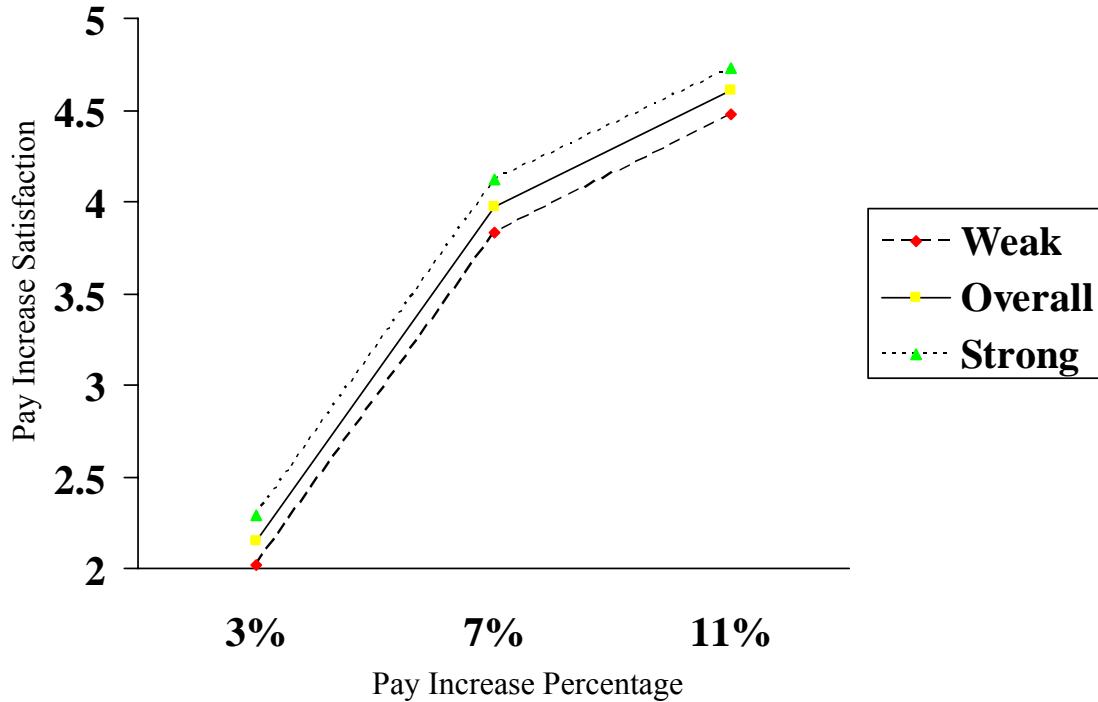
Participants who received a questionnaire with the "weak" condition were not given any information about an annual salary. Participants in this condition simply were asked to indicate their satisfaction with pay increases of three percent, seven percent, and eleven percent using the same Likert-type scale as those participants in the signal condition. Similar to the "strong" condition, pay increases were given in random order, such that one-third of the participants received three percent first, another third received the questionnaire with 7% first, and the last one-third received 11% first.

## Results

Hypothesis 1 predicted that a curvilinear trend would exist between pay increase percentage and pay satisfaction such that there is a point at which pay satisfaction would asymptote and remain constant. After squaring the independent variable, a repeated measures multivariate analysis indicated a significant main effect for this hypothesis,  $F(2, 115) = 288.28$ ,  $p < .01$ . An examination of the pay satisfaction means confirmed the curvilinear trend between the predicted variable and the three criterion levels, as the means for pay satisfaction for the three, seven, and eleven percent increases were 2.15, 3.97, and 4.61 respectively (see Figure 1).

Follow-up tests were conducted to evaluate the three pair-wise differences among the means for percentage pay increase. After instituting a Bonferroni adjustment ( $p = .016$ ) to control for experiment wise error, paired samples  $t$ -tests indicated a significant increase in pay satisfaction between the three percent and seven percent increase,  $t(116) = -18.37$ ,  $p < .01$ . In addition, paired samples  $t$ -tests indicated a significant increase in pay satisfaction between the 3% and 11% increase,  $t(116) = -22.66$ ,  $p < .01$ . Lastly, the paired samples  $t$ -test revealed significance for pay satisfaction between the 7% and 11% increases,  $t(116) = -8.18$ ,  $p < .01$ . Thus, the results show partial support for hypothesis 1 in that it did produce a curvilinear relationship, but it did not result in an asymptote between 7% and 11%, as pay satisfaction was significantly different between 11% and 7%.

**Figure 1**  
**Illustration of the relationship between pay increase satisfaction and pay increase percentages at three, seven, and eleven percent for the strong condition, weak condition, and overall.**



Hypotheses 2a and 2b suggested that the nature of the curvilinear trend would asymptote between six and eight percent. As indicated above, it was found that a distinct asymptote did not emerge. Participants reported greater pay increase satisfaction with a 7% pay increase ( $M = 3.97$ ) than a three percent increase ( $M = 2.15$ ), but also reported greater pay increase satisfaction with an 11% pay increase ( $M = 4.61$ ) than a 7% pay increase ( $M = 3.97$ ).

*Supplemental analyses.* Supplemental analyses were conducted between the “strong” condition, in which a hypothetical salary was given to participants, and “weak” condition, in which no salary information was given to participants, to determine if the additional salary information would impact the minimum amount of a pay increase needed for satisfaction. As indicated earlier, we included an open-ended question asking respondents to indicate the minimum percentage pay increase they would need to receive in order to report being satisfied with a pay increase. In the “strong” condition (in which a hypothetical salary was provided), descriptive analyses indicated that a mean of 6.67 percent was the minimum pay increase necessary for pay increase satisfaction. On the other hand, a mean of 8.00 percent was found to be the minimum increase in pay for satisfaction in the “weak” condition. However, a  $t$ -test indicated that these means were not statistically significant  $t(113) = -1.66$ ,  $p = .09$ . Thus, information concerning the amount of salary had no significant impact on the percentages of a pay increase needed to

achieve pay increase satisfaction. Interestingly, these results confirm Mitra et al.'s (1997) and Katkowski et al.'s (2002) research indicating that pay increases between six to eight percent is the minimum amount needed for pay increase satisfaction.

## Discussion

This study found partial support for both hypotheses. In particular, this study found that there was an increase in pay increase satisfaction between the three percent and seven percent pay increase and a slight rise in pay increase satisfaction between the seven percent and eleven percent pay increase. Although evidence of a curvilinear trend was found, the relationship did not asymptote between seven and eleven percent as expected.

Despite the mixed results several comparisons can be made with previous research investigating reactions to pay increases. Specifically, Rambo and Pinto (1989), Champlin and Kopelman (1991), and Worley et al. (1992) found that positive reactions to pay increases were not as great at increasingly higher levels of pay increases as they were in lower levels of pay increases. The present study found a similar trend in that pay increase satisfaction increased nearly 85% from three percent ( $M = 2.15$ ) to seven percent ( $M = 3.97$ ), but the change was less pronounced (only 16%) between seven percent ( $M = 3.97$ ) and eleven percent ( $M = 4.61$ ). In our study as well as the Rambo and Pinto, Champlin and Kopelman, and Worley et al. studies, a similar curvilinear trend was found in that satisfaction increased rapidly from low to moderate pay increase levels and less so from moderate to high pay increase levels. In addition, this curvilinear trend suggests that there may be a level of pay increases that causes an asymptote in pay increase satisfaction, although that level was not identified in this study.

One possible explanation for the observed curvilinear trend demonstrated in the present study may be due to distortions of the inputs and outcomes explained by equity theory (Huseman, Hatfield, & Miles, 1987). It is said that when an inequitable situation occurs, people attempt to reduce the inequity and try to restore equity. A person may change comparison others or over/under estimate inputs leading to an equitable situation. So, even if a situation at first may be inequitable, a person may distort their own perception to make it appear equitable. The participants in this study may have distorted the higher percentage pay increases as being equal to the amount or quality of work he or she actually provided in the workplace.

Moreover, hypotheses 2a and 2b stated that participants would be the more satisfied with pay increases between six to eight percent and less satisfied with pay increases below six percent. Participants were in fact less satisfied with pay increase percentages less than six percent. However, participants reported being more satisfied with pay increase percentages above eight percent, thus indicating participants experience greater satisfaction as pay increase percentages increases.

This study, then, extends the research by Mitra et al. (1997) and by Katkowski et al. (2002) in that it used both a direct estimation procedure for determining pay increase satisfaction, as well as a providing different percentage increases when evaluating pay increase satisfaction. In particular, Katkowski et al.'s direct estimation procedure involved asking participants the size of the pay increase

they would be most satisfied with. Using this method, Katkowski et al. found a just noticeable difference estimate of 7.5% as an indication of how large a percentage pay increase needed to be noticeable by participants. In this study, asking participants, “What is the minimum percentage of pay increase that you would be satisfied with in your current position?” revealed that the minimum amount for satisfaction was a 7.33% pay increase. Consequently, these results closely corroborated Katkowski et al.’s findings.

Furthermore, Katkowski et al. (2002) examined within-grade pay increases within a specific range of salary in which promotions occurred as well as merit pay increases. Because Katkowski et al did not separate those who received merit pay increases and those who did not in their research, it is probable that employee reactions to pay increases were confounded with the typical increase in pay that is associated with promotions. Interestingly, despite this potential confound, our results still corroborated Katkowski et al.’s and Mitra et al.’s (1997) findings that the average salary increase needed to obtain pay satisfaction is around 7%. Thus, future research should examine participants’ reactions to different types of pay increases, such as merit pay increases, as opposed to tenure-based or cost-of-living based pay increases.

In addition to the above hypotheses, supplemental analyses were conducted to evaluate if there were any differences in participants’ pay satisfaction between the “strong” and “weak” conditions. The signal for participants in the “strong” condition was the average starting salary for MBA students. The “weak” condition, on the other hand, did not include a hypothetical salary. Hence, participants in the “weak” condition were forced to create their own comparisons. It was found that when the participants were given the hypothetical salary in the “strong” condition, they reported needing a 6.67% pay increase to be satisfied. However, those participants in the “weak” condition or those who did not receive a starting salary stated that an 8% minimum pay increase would be required for pay increase satisfaction. Although not quite statistically significant in this study ( $p = .09$ ), the difference between 6.67% and 8% of each employee’s current salary could save an organization thousands of dollars annually if these differences are consistent. For example, if an organization consisted of 100 employees each making \$50,000 annually, an 8% pay increase per employee would cost the organization a total of \$400,000 annually and not necessarily lead to more satisfaction, whereas, a 6.67% pay increase per employee would cost the organization a total of \$333,500 annually. Hence, this 1.33% pay increase difference could save this organization a total of \$66,500 annually and still satisfy employees.

One implication of the above finding is that organizations may want to advertise typical pay increases. By divulging pay increase information, employees are given a “signal” or a “comparison” to base their own judgments. This strategy may be particularly important when one considers that the average salary increase was only expected to be 3.5% during the time frame of our data collection (Mercer Human Resource Consulting). Yet, the results of our study and those that preceded it (e.g., Katkowski et al. and Mitra et al.) suggest that it would take a pay increase of around seven percent in order to produce a meaningful increase in pay satisfaction. Given that result, one might question the utility of giving a 3.5% pay increase. In

other words, if organizations can only afford a 3.5% pay increase, might they be better not giving a pay increase at all? Our guess, however, is that providing a “signal” in the form of typical pay increase percentages may reduce employee expectations and, consequently, increases in pay satisfaction may be realized when evaluated in the proper context. Without question, this is an issue that needs more research, and future investigations should examine participants’ reactions to salaries that are both above and below the industry or organizational standard.

Along these lines, it may be equally useful to investigate levels of pay raises that produce no increases in pay satisfaction or even decreases in pay satisfaction. For instance, “signals” such communicating typical pay increases may only go so far in increasing pay satisfaction. It may be that, even in the presence of such signals, there are some pay increase levels that are so low they may illicit no increases in pay satisfaction or, worse, decreases in pay satisfaction.<sup>1</sup>

In addition to the signal, another factor that may need to be examined in future research is the employee’s personality. Some personality types may be more sensitive to signals like pay increases than others (Shaw, Duffy, Jenkins, & Gupta, 1999). Shaw et al. found that those with higher positive affectivity have a higher degree of signal sensitivity, thus noticing and reacting positively to smaller pay raises than those with low positive affectivity. Furthermore, Shaw, Duffy, Lockhart, Mitra, Bowler (2003) found that there was a positive relationship between merit pay increase size and happiness with individuals that are low in positive affectivity. In addition, their results indicated that those individuals with low positive affectivity needed a larger pay increase amount for satisfaction. Thus, organizations may need to account for different personality types in the workforce and their sensitivity to rewards. For example, employees low in positive affectivity may benefit from having a strong signal, such as salary information.

## **Limitations**

One of the limitations of this study may have been with the pay increase percentages used in this study. The fact that the asymptote was not observed may be due to the actual range in the pay increase percentages used in this study, which were three, seven and eleven percent. Perhaps an asymptote would have occurred if the percentage range were increased beyond eleven percent. Future research may need to explore a larger pay increase range as well as smaller increments between pay increases, such as two percent increments between pay increases rather than the four percent increments used in this study.

Another limitation is that the participants may have been affected by other percentages used on the questionnaire due to the use of a within-subjects design rather than a between-subjects design. In other words, participants may have considered all of the situation-based questions first and compared three percent, seven percent, and eleven percent to each other instead of answering the questions individually. In doing so, three percent (the smallest number) would have been rated as least satisfactory, whereas eleven percent would have been rated as the most satisfactory because it was the largest number. However, using a within-subjects design allowed the researchers to compare participants’ reactions to all of the pay

increase percentages. Future research may benefit by giving one question per page to the same subjects or to employ a between-subjects design in which participants evaluate only one percentage increase.

Finally, the categorical nature of the questionnaire does not allow for an exact asymptote to be found. However, this methodology may yield an approximate pay increase percentage range for pay increase satisfaction that shows trends of an asymptote. It is also important to recall that this is one of the first exploratory studies examining pay increase satisfaction using components of signal detection theory.

## **Contributions**

This study provided a new approach toward investigating reactions to pay increases by emphasizing the notion that “signals,” an idea that is often used in the sensory and perception literature, has an application in organizational settings. The results indicated that pay satisfaction had the largest increase between pay increases of three and seven percent and appeared to begin to level off between pay increases of seven and eleven percent. Although the results did not reveal evidence of an asymptote, a definite curvilinear trend emerged in that pay increase satisfaction increased rapidly at smaller pay increases and appeared to level off at larger pay increases, suggesting there may be a point at which high pay increases may not necessarily lead to more satisfaction. In addition, this study found that by providing participants with a signal, as in the “strong” condition, may reduce the amount of a pay increase needed in order to experience pay satisfaction. Finally, the results of this study corroborated Mitra et al.’s (1997) and Katkowski et al.’s (2002) findings that pay increases between six to eight percent is the minimum amount needed for pay increase satisfaction.

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**Questions regarding this study should be addressed to:**

Mark S. Nagy, Ph.D.  
Director, MA I-O Psychology Program  
Department of Psychology  
Xavier University  
Cincinnati, OH 45207-6511  
(513) 745-1958  
[nagyms@xu.edu](mailto:nagyms@xu.edu)