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Voluntary turnover among engineers : a descriptive analysis

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**VOLUNTARY TURNOVER AMONG ENGINEERS:
A DESCRIPTIVE ANALYSIS**

A Thesis

Presented to

the Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Parisa Sobhani

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ABSTRACT

VOLUNTARY TURNOVER AMONG ENGINEERS:

A DESCRIPTIVE ANALYSIS

by Parisa Sobhani

This thesis examined completely voluntary turnover among 31 product, test, process, applications, design, equipment and software engineers. It was hypothesized that turnover emanates from unmet expectations and unsuccessful attempts to change the situation. As predicted, the expectations of employees who left the organization were more unmet than met. Contrary to what was expected, 71% of the employees found success in trying to change their situation. Further analysis of employees' decisions to voluntarily terminate employment revealed that turnover was neither avoidable nor unavoidable for the organization. Implications of the study and suggestions for future research are made.

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Voluntary Turnover Among Engineers:

A Descriptive Analysis

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Abstract

This thesis examined completely voluntary turnover among 31 product, test, process, applications, design, equipment and software engineers. It was hypothesized that turnover emanates from unmet expectations and unsuccessful attempts to change the situation. As predicted, the expectations of employees who left the organization were more unmet than met. Contrary to what was expected, 71% of the employees found success in trying to change their situation. Further analysis of employees' decisions to voluntarily terminate employment revealed that turnover was neither avoidable nor unavoidable for the organization. Implications of the study and suggestions for future research are made.

Voluntary Turnover Among Engineers:

A Descriptive Analysis

The subject of employee turnover has intrigued researchers for well over eighty-five years, with early studies dating back to Crabb in 1912 (Muchinsky & Morrow, 1980). Indeed, Steers and Mowday (1981) confirmed that over 1,000 studies on turnover could be identified. The act of turnover is best defined as “a permanent movement beyond the boundary of an organization” (Macy & Mirvis, 1983, p. 142). When individuals leave an organization it costs organizations in terms of time, money, and productivity. Mobley and Hall (1973), as cited in Mobley (1982a), found that the turnover cost (lost training investment plus replacement cost) of operators in a fiber manufacturing operation was \$98,500 per 100 trainees during the first eight weeks of employment. According to the U.S. Department of Labor it costs an organization one-third of a new hire’s annual salary to replace an employee (White, 1995). Historically, increased turnover rates have been associated with the high price tag of lagging U.S. productivity and the failure of U.S. industries to effectively compete (Phillips, 1990).

Besides the obvious high costs of recruiting, hiring, and assimilating new employees, organizations can experience other potentially negative consequences (Mobley, 1982b). The cost of replacements, out-processing costs, disruption of social and communications structures, loss of productivity, loss of high performers, decreased satisfaction among those who stay, and negative public relations from those who leave can all be considered negative organizational consequences. At an individual level, negative consequences can be related to the loss of seniority, disruption of family and

social support, loss of non-vested benefits, transition related stress, inflation related costs such as mortgage costs, disruption of spouse's career path, and career path regression. At times individuals may also encounter the "grass is greener" phenomenon and subsequent disillusionment as another negative consequence of turnover. Table 1 summarizes the potential negative organizational and individual consequences of turnover.

Definition of Turnover

The definition of turnover is not always explicit and poses an uncertain criterion in research. In a review by Muchinsky and Tuttle (1979) it was noted that the distinction between voluntary and involuntary turnover was unclear for the majority of the 150 studies. Despite the fact that earlier reviews encouraged refinement of turnover (Schuh, 1967; Vroom, 1964), it was found that "these two groups are combined to form a generalized group of 'leavers' because the investigators either felt there was little or nothing to be gained by keeping them separate, or because the investigators were faced with the problem of small sample sizes..." (Muchinsky & Tuttle, 1979, p. 67).

Voluntary turnover is usually considered to be employee initiated, whereas involuntary turnover is regarded as company initiated. Such distinctions, however, are not necessarily clear in practice or in research. For example, how does one classify a resignation that has been either vaguely or explicitly encouraged by an organization? The dichotomous nature of such classifications was recently challenged by Campion (1991). He believed that the distinction between voluntary and involuntary turnover was artificial and that the decision to terminate employment was a function of both the individual and the organization. According to Campion (1991), voluntary termination should be seen as

Table 1

Possible negative consequences of turnover for organizations and individuals.

Organizational Consequences	Individual Consequences
<ul style="list-style-type: none"> • Costs (recruiting, hiring, assimilation, training) • Replacement costs • Out-processing costs • Disruption of social and communication structures • Productivity loss (during replacement search and training) • Loss of high performers • Decreased satisfaction among stayers • Negative PR from leavers 	<ul style="list-style-type: none"> • Loss of seniority and related prerequisites • Loss of non-vested benefits • Disruption of family and social support systems • "Grass is greener" phenomenon and subsequent disillusionment • Inflation related costs (e.g., mortgage cost) • Transition related stress • Disruption of spouse's career path • Career path regression

a continuum ranging from completely voluntary (e.g., the employee quits for a better job), through mutual agreement (e.g., the employee agrees to leave because of disagreements with supervisors), to completely involuntary (e.g., the company decides to lay off the employee as a result of a reduction in force). For the purposes of this study, the focus will be on completely voluntary resignations.

Dalton, Krackhardt, and Porter (1981) believed that classifying turnover as either voluntary or involuntary can overstate both the problem and the degree to which it's managed in the organization. They held that a refinement of terminology which distinguished between avoidable and unavoidable voluntary termination would be essential in further understanding and predicting turnover. Abelson (1987) provided some examples of (a) voluntary and involuntary, and (b) avoidable and unavoidable turnover based on whether the decision to terminate was organizationally or individually controlled (see Table 2). Voluntary avoidable turnover occurs when individuals encounter problems with leadership or administration, leave to work for a better organizations, or find better pay or working conditions in another organization. Voluntary unavoidable turnover occurs in situations where individuals don't come back after maternity leave, decide on a mid-career change, stay home to care for spouse or children, or move to another location. Mobley (1977) made a similar distinction of voluntary unavoidable turnover by including "non-job related" factors such as the transfer of a spouse in his model. In the Steers and Mowday (1981) model of turnover, variables termed "non-work influences on staying and leaving" were also included.

Table 2

Organizational and individual decisions of voluntary, involuntary, avoidable and unavoidable turnover.

	VOLUNTARY	INVOLUNTARY
AVOIDABLE	<ul style="list-style-type: none"> • better pay elsewhere • better working conditions elsewhere • problems with leadership or administration • better organization to work for elsewhere 	<ul style="list-style-type: none"> • dismissal • layoff • forced retirement
UNAVOIDABLE	<ul style="list-style-type: none"> • move to another location spouse imposed • mid-career change • stay home to care for spouse/children • pregnancy, did not return after limited period of time 	<ul style="list-style-type: none"> • severe medical problems • death

The design of an avoidable-unavoidable model allows organizations to potentially control turnover. Unavoidable turnover is considered to be unfavorable when the organization can not take actions to prevent it. Avoidable turnover is desirable if an organization could have prevented an employee's decision to leave but decided not to for some reason. Instances where this may happen would occur if the performance of the employee was poor, the required pay increase was too large, the organization was unwilling to change the employee's manager, the organization needed to reduce the work force, or it was too expensive to improve working conditions. For these reasons, Campion (1991) suggested a continuous classification of avoidable and unavoidable turnover. He believed that a continuous measure would recognize most turnover as avoidable at some extreme (e.g., making the employee president of a company or tripling the pay) and that "avoidability" would be a matter of reasonableness within the constraints of an organization. Leaving to raise a family would be more unavoidable than leaving for a promotion, which in turn would be more unavoidable than leaving for a small pay increase. This study will assess the avoidance of completely voluntary resignations, which were clearly undesirable for the organization, using Campion's (1991) "avoidability" measure.

Determinants of Turnover

The notion that people's expectations have an impact on the rate of turnover was first investigated by Weitz (1956). This investigation took place at an insurance company where an experimental group of agents received a realistic job outlook in a booklet format. Applicants were given a thorough description of the job duties and tasks as well

as the time involved in each of the activities on a daily basis. When the experimental and control groups were compared, support was found for the hypothesis that a "realistic" job outlook would decrease the chance of agent termination.

Katzell (1968) applied the same theory to a group of nursing students and found that realistic expectations correlated negatively with job turnover. As cited in Porter and Steers (1973), Macedonia (1969) found the same results in a study of newcomers at the United States Military Academy. Cadets who received realistic information in a booklet form were more likely to join the organization and less likely to voluntarily leave. In a study by Ilgen and Seely (1974), realistic information was given to employees after they had made the decision to join the organization. Again, employees who did not receive a realistic job preview were more likely to leave the organization.

The concepts of realistic and met expectations are essentially the same (Greenhaus, Seidel, & Marinis, 1983). Job expectations are the beliefs that individuals have about attaining a job outcome and they are realistic to the extent that they are met on the job. The first researchers to introduce the role of met expectation in the turnover process were Porter and Steers (1973). They defined the concept of met expectations as "the discrepancy between what a person encounters on the job in the way of positive and negative experiences and what he expected to encounter" (p. 152). The model holds that although employees expect their jobs to provide certain outcomes (e.g., pay, promotion, benefits, autonomy, supervisory relations, and peer group interactions), the range and importance of these factors vary uniquely across individuals. When the difference between what is experienced and what is expected becomes sufficiently large, the

expectations are considered to be unmet. Porter and Steers thought that these unmet expectations lead to dissatisfaction and eventually the employee voluntarily terminates.

Some empirical support has been provided for the met expectations model in several reviews of the literature (Cotton & Tuttle, 1986; Muchinsky & Tuttle, 1979; Wanous, Poland, Premack, & Davis, 1992). In their review and meta-analysis of 31 met expectations studies, Wanous et al. (1992) found mean corrected correlations of .39 for job satisfaction and organizational commitment, .29 for intent to leave, .19 for job survival, and .11 for job performance. Federico, Federico, and Lundquist (1976) also showed the discrepancy between actual salary achieved on the job and expected salary as the single most important predictor of turnover among credit union employees. Indeed, established support for met expectations has led some researchers to include it in their examination of turnover (Arnold & Feldman, 1982; Steers & Mowday, 1981), while others have suggested its addition to existing models (Michaels & Spector, 1982).

Although widely accepted, met expectations has not gone unchallenged (Dugoni & Ilgen, 1981; Ilgen & Dugoni, 1977; Mobley, Griffeth, Hand, & Meglino, 1979). In a longitudinal study, Irving and Meyer (1994) pointed to some inherent problems in many of the individual tests of met expectations. They questioned the meta-analysis that Wanous et al. (1992) conducted and only found modest support for the met expectations hypothesis. Suggestions to improve attitudes and lower turnover intentions were made focusing on the enhancement of positive work experiences rather than the confirmation of expectations. The use of direct measures in met expectations research has also been criticized (Edwards & Cooper, 1990). Irving and Meyer (1995) concluded that future

research should avoid the use of direct measures and concentrate on separate measures of expectations and experiences. This study will examine expectations and experiences separately for individuals who voluntarily left the organization.

According to the met-unmet model, when employees believe their experiences match their expectations they are less likely to leave an organization (Porter & Steers, 1973). When individuals feel a disconnect between their experiences and expectations, they will try to change the situation before actually terminating. Steers and Mowday (1981) were the first to introduce this concept and in doing so they held that employees' efforts to change a situation include such actions as transferring, restructuring the job, restructuring job responsibilities, threatening to leave, and forcing someone else to leave.

In a test of Steers and Mowday's (1981) model, efforts to change a situation did not relate to affective responses to the job (Lee & Mowday, 1987). Despite some of the non-supportive data that was collected, Lee and Mowday (1987) did not think it was appropriate to delete "efforts to change a situation from the model on the basis of a single study" (p. 738). Part of the problem in this test could be linked to how these researchers measured the variable. Lee and Mowday (1987) measured the frequency of efforts to change the situation. This was not what the original architects of the model intended to measure, for they were concerned with whether attempts to change a situation were successful or not. Indeed, employees can find success the first time they attempt to alter their situation, or they may try five times before they are successful.

In a sense, having this information can serve as a diagnostic tool for organizations who want to retain their employees. If an employee wants to transfer, organizations

should know why there's a request being made and how they can make necessary accommodations. This study will focus on the successful and unsuccessful attempts that employees make before voluntarily leaving the company.

Turnover Among Engineers

The impact of employee turnover amongst engineers is especially troubling given the "hot market" and demand for these professionals ("Employment and Unemployment: Jobs," 1997). Indeed, the first quarter of 1997 marked an all time high of 2,051,000 employed engineers ("Employment and Unemployment: Number," 1997). Unemployment has also hit the lowest level since the recession of the early 1990s, standing at 1.5 percent for the profession ("Employment and Unemployment: Jobs," 1997). The decreasing college enrollments ("Engineering degrees," 1995; "Enrollments," 1997; Igarria & Siegel, 1992; Weatherall, 1997) has further created a "hot market" for new graduates in engineering (Weatherall, 1997). In the Fall 1996 survey of college enrollments, the Engineering Workforce Commission of the American Association of Engineering Societies reported a decline at every level of engineering ("Enrollments," 1997). The same projections were made by the National Science Foundation which forecasted a shortfall of 675,000 people with bachelor's degrees in the natural sciences and engineering by the year 2006 (Arpino, 1991). Given these statistics and increasing competition, effective retention programs in high tech organizations must strive to decrease employee turnover.

Even though turnover presents an important area of study within the industry, a review of the literature revealed that only a small amount of research has been conducted.

Of the research that does exist, only a few have incorporated variables identified in this study (Farris, 1971; Sherman, 1989; Steers, 1977; Zenger, 1992). For example, Farris (1971) and Zenger (1992) included individual expectations of pay in their examination of turnover and found a negative relation even when pay was given for extreme performance. Although Sherman (1989) did not examine met-unmet expectations, he found factors influenced by the behavior of the technical manager (e.g., employee autonomy) have a negative effect on turnover propensity for engineering and scientific personnel. In another study of scientists and engineers, Steers (1977) included work experiences as a precursor of organizational commitment and found a strong relation between commitment and intention to stay in the organization.

The Current Study

The purpose of this study is to (a) examine completely voluntary turnover and its avoidance, (b) incorporate the findings of met expectations and efforts to change the situation literature in explaining turnover, and (c) apply outcomes of met expectations and efforts to change the situation to product, test, process, applications, design, equipment, and software engineers in a semiconductor company. The study will be conducted at a high-tech company located in Santa Clara, California, which has about 12,300 employees worldwide. The business focus of the organization is primarily on technologies that provide highly integrated digital, analog, and mixed signal system solutions.

It is hypothesized that turnover in the company can be explained by unmet expectations and unsuccessful attempts at changing the situation. Drawing from research

findings on realistic job previews and met expectations, it is predicted that the more one's experiences in the organization resembles what one expects, the less likely that person is to leave the organization. On the other hand, if employees find that their expectations are not met they will try to change the situation. If employees are successful in their attempts to change a situation, then they will remain with the organization. Steers and Mowday (1981) were the first researchers to include this predictor in their model and in doing so they held that the frequency of attempts could vary across individuals. Sometimes people are successful in their first attempt at changing their situation and at other times they may try only to find no other alternative but to leave. Over time if employees are not successful in their attempts, they will eventually terminate their employment with the organization.

Method

Participants

Information was gathered from engineers who had voluntarily left the organization in 1996. Out of a sample of 125 individuals, 52 responded to a phone interview and 31 completed both the phone interview and the questionnaire, yielding a 25% response rate. Different types of engineers including 3 product, 2 test, 2 process, 3 applications, 11 design, 1 equipment, and 3 software engineers were represented. All participants were between the ages of 26 and 54, with a mean age of 35.8 years ($SD = 5.60$). The mean years of experience for all engineers was 8.94 ($SD = 4.66$). All participants had a college education with 35% holding a Bachelor's degree, 55% holding a Master's degree, and 10% holding a Doctoral degree.

Variables and Measures

Voluntary turnover. Voluntary turnover was assessed using exit interviews. An important note needs to be made about the usefulness of such a measure in the current study. Exit interviews have been shown to be a deficient source of information, since in most cases only a single reason is recorded (Campion, 1991; Giacalone & Duhon, 1991; McEvoy & Cascio, 1985). Sometimes this reason is not enough to determine if resignation was completely voluntary or not. To get around this problem, participants were asked to state all the reasons for leaving the organization before questionnaire administration. In addition, human resources managers provided a list of reasons for each of the voluntary resignations. This follows the suggestion that Campion (1991) made regarding the need to gather information from multiple sources within an organization and to record multiple reasons for voluntary terminations.

Job expectations. Participants' expectations were assessed based on a scale used in an internal employee survey (International Survey Research, 1996). Participants were asked, "How important were the following to how you felt about your job?" The following scales were included: management, employee involvement/teamwork, communication, employee development, career advancement, performance appraisals, pay/recognition, benefits, working organization/operating efficiency, supervision, and job security. A 5-point anchor ranging from not at all important to very important was used. Since importance was used as a proxy measure of expectations, larger scores corresponded to greater expectations.

Organizational experiences. Participants were asked to describe their reactions to organizational experiences corresponding to the 11 aforementioned sub-scales. The following sample of experiences correspond respectively to these sub-scales: (1) The decisions management made concerning employees were usually fair; (2) I was satisfied with my involvement in decisions that affected my work; (3) It was safe to speak up in this company; (4) There were sufficient opportunities for me to receive training to increase my eligibility for a better job; (5) There was adequate opportunity for employees to learn about available job openings; (6) I thought my performance on the job was evaluated fairly; (7) Compared with other people performing similar responsibilities, I thought I was paid fairly; (8) National's benefits programs fit my needs; (9) There was usually sufficient staff in my work group to handle the workload; (10) My supervisor was available when needed; and (11) I could be sure of having a job with this company as long as I perform well. Participants were asked to, "Please complete these questions as if it were your last day on the job..." A 5-point anchor ranging from agree to disagree was used. The more participants agreed with an item, the more positive their experiences were in the organization.

Met expectations. The average of participants' expectations were measured to create a single indicator of expectations. This was based on a continuum, where 5 indicated the greatest and 1 the lowest expectations. The average of participants' experiences were also measured to create a single indicator of experiences. This indicator was based on a continuum, where 1 indicated the most positive and 5 the most negative experiences. Following Porter and Steers (1973) definition of met expectations as the

discrepancy between expectations and experiences, met expectations was assessed by subtracting the average of expectations by the average of experiences. This continuous variable represented scores of 0 for completely unmet and 4 for completely met expectations.

Efforts to change the situation. Participants were asked to describe their efforts to change the situation when they were unhappy with their jobs. Specifically, they were asked if they had actually tried to transfer, change the job itself, change responsibilities, threaten to leave, or force someone else to leave. Then they were asked if they were successful in their efforts. Respondents were to enter yes or no to these questions.

Avoidable-unavoidable turnover. The degree to which the decision to leave could have been avoided by an organization was assessed using Campion's (1991) "avoidability" measure. Four of the seven items were used including: "The organization could have convinced me to stay", "The factors influencing the decision to leave were beyond the organization's control", "I would have stayed if things were better at the organization", and "The organization could have made changes which would have led me to stay". A 5-point anchor measuring strongly disagree to strongly agree was used for these items. The average of the four questions was taken to create a single indicator of avoidance. A score of 1 corresponded to more avoidable and a 5 to more unavoidable situations of voluntary turnover.

Procedures

A list of employees who left the organization in 1996 was obtained through personnel records. Initially, phone interviews were conducted to assess participants'

reasons for terminating their employment. At the end of the interview, participants were asked if they would take a few minutes to fill out a written questionnaire. They were further assured that participation in the study was completely voluntary and that their anonymity was secured. If participants agreed to fill out the questionnaire, they were promised a copy of the findings of this paper.

Results

Exit interviews were initially used to determine voluntary turnover. Based on this criteria, employees who were placed on a performance enhancement plan or had mutually separated were excluded from the sample. Out of the remaining 125 individuals, a list of termination reasons was gathered internally from human resources managers. Among the top reasons for turnover were: (1) start-ups (14%), (2) shutdown of business/project canceled (11%), (3) money (10%), (4) job insecurity/too many changes (9%), and (5) better opportunity elsewhere (8%). Of the 52 participants who were contacted by phone, their reasons for leaving the organization included: (1) time for a change (25%), (2) stock options (21%), (3) didn't see a future/lack of opportunities (21%), (4) job insecurity/too many changes (21%), and (5) better opportunity elsewhere (19%).

A single measure of employee expectations (EXPECT) was assessed by averaging the scores from the 11 sub-scales of management, employee involvement, communications, employee development, career advancement, performance appraisal, pay and recognition, benefits, work organization and operating efficiency, supervisor, and job security. This continuous variable ranged between the scores of 1 for low expectations and 5 for high expectations. As shown in Figure 1, the normal distribution of

Figure 1. Percentages of high and low expectations ($\underline{M}$ = 4.28, $\underline{SD}$ = .41).

scores ranged between 3.55 and 5.00.

Employees' particular expectations within the EXPECT scale was also examined. Pay and recognition were rated as the most important to their job, with a mean of 4.61 ($SD = .62$). Conversely, job security was least important with a mean of 3.71 ($SD = 1.07$). Overall, employees had high expectations ($M = 4.28$, $SD = .41$). Table 3 displays descriptive statistics on each expectation.

A single indicator of employee experiences (EXPERI), which corresponded to the 11 aforementioned sub-scales, was created by taking the average of all scores. This variable was based on a continuum of scores where 1 represented positive and 5 represented negative experiences. As shown in Figure 2, the normal distribution of scores ranged between 1.90 and 4.00.

The most positive experience was associated with the question: "I had a very clear understanding of my job responsibilities" ($M = 1.87$, $SD = .72$). Questions such as "My supervisor managed people well" and "My work group operated efficiently" warranted the most negative experiences, with means of 3.65 ($SD = 1.08$) and 3.65 ($SD = 1.20$) respectively. Experiences for each of the sub-scales further revealed the most positive scores to be related to benefits ($M = 2.13$; $SD = .85$) and the most negative scores to be related to management ($M = 3.43$, $SD = .82$). Overall, employee experiences were neutral ($M = 2.96$, $SD = .43$). Descriptive statistics on experiences for each sub-scale can be found in Table 4.

Met expectations (MET) were measured by subtracting the variables EXPERI from EXPECT. Scores ranged between 0 for completely unmet and 4 for completely met

Table 3

Descriptive statistics of expectations sub-scales.

EXPECTATIONS	<u>M</u>	<u>SD</u>
Management	4.45	.57
Employee Involvement & Teamwork	4.52	.63
Communications	4.26	.68
Employee Development	4.35	.71
Career Advancement	4.32	.91
Performance Appraisal	4.35	.80
Pay & Recognition	4.61	.62
Benefits	4.13	.67
Work Organization & Operating Efficiency	4.19	.79
Supervisor	4.19	.60
Job Security	3.71	1.07

Figure 2. Percentages of positive and negative experiences ($M = 2.96$, $SD = .43$).

Table 4

Descriptive statistics of experiences sub-scales.

EXPERIENCES	<u>M</u>	<u>SD</u>
Management	3.43	.82
Employee Involvement & Teamwork	2.89	.63
Communications	2.82	.81
Employee Development	2.68	.86
Career Advancement	2.98	.84
Performance Appraisal	3.18	.86
Pay & Recognition	3.15	1.30
Benefits	2.13	.85
Work Organization & Operating Efficiency	3.00	.60
Supervisor	2.97	.74
Job Security	3.16	.74

expectations. A normal distribution of scores revealed a range between .36 and 3.00. Employee expectations seemed in general to be more unmet than met ($\underline{M} = 1.33$, $\underline{SD} = .59$). The percentages of met-unmet expectations are displayed in Figure 3.

The number of attempts to change a situation was normally distributed with a low score of 0 and a high score of 4 for the sample. Often times employees tried to change the job itself ($\underline{M} = .71$, $\underline{SD} = .46$) and they never tried to force someone else to leave ($\underline{M} = 0$, $\underline{SD} = 0$). Overall, employees tried to change their situation about 1.74 ($SD = 1.15$) times.

Success at efforts to change a situation showed normally distributed scores with ranges of 0 and 3. Employees who attempted to change the situation found the greatest success by changing the job itself ($\underline{M} = .35$, $\underline{SD} = .49$). In general, employees were successful in their efforts to change the situation about once ($\underline{M} = .97$, $\underline{SD} = .80$). Groups of individuals who were successful consisted of 71%, whereas those who weren't successful comprised 16% of the sample (see Figure 4). Table 5 summarizes the means and standard deviations of efforts and success at changing the situation. Figure 5 and 6, respectively show the frequencies for these variables.

The avoidance of turnover (AVOID) was assessed by averaging scores where 1 corresponded to completely avoidable and 5 corresponded to completely unavoidable situations. A normal distribution of scores revealed ranges between 1 and 4.5. Based on a mean of 2.72 ($\underline{SD} = .80$), it can be said that turnover was neither avoidable nor unavoidable. Figure 7 shows the percentages of voluntary avoidable and unavoidable turnover for the organization.

Figure 3. Percentages of met and unmet expectations ($M = 1.33$, $SD = .59$).

Figure 4. Groups of individuals who never tried, tried and were successful, tried and were unsuccessful at changing the situation.

Table 5

Descriptive statistics of efforts and success in changing situation.

	EFFORTS TO CHANGE SITUATION		SUCCESS AT EFFORTS TO CHANGE	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
TRANSFER	.48	.51	.29	.46
CHANGE JOB	.71	.46	.35	.49
CHANGE RESPOSIBILITIES	.42	.50	.23	.43
THREATEN TO LEAVE	.13	.34	.10	.30
FORCE SOMEONE TO LEAVE	.00	.00	.00	.00

Figure 5. Percentages of employees who attempted to change the situation ($\bar{M} = 1.74$, $SD = 1.15$).

Figure 6. Percentages of employees who succeeded in changing the situation ($\bar{M} = .97$, $SD = .80$).

Figure 7. Percentages of voluntary avoidable and unavoidable turnover ($\underline{M} = 2.72$, $\underline{SD} = .80$).

Correlations were also run between expectations and experiences for each of the 11 sub-scales. Results, however, showed non-significant relations between these variables. This finding could be due to the non-linear relationship between people's expectations and experiences in the organization. Table 6 illustrates the correlations of expectations and experiences of each sub-scale.

Discussion

Purpose of Study

Employee turnover is inevitable. In today's job market, even high growth organizations may witness this phenomena (Posner, 1990). In fact, turnover has potential advantages for both individuals and organizations. At an individual level, it allows for renewed stimulation in a new environment, increased earnings, career advancement, and better "person-organization fit" (Mobley, 1982b). For organizations, turnover allows stimulation for changes in policies and practices, infusion of new knowledge via replacements, reduction of costs, displacement of poor performers, and increases in internal mobility opportunities (Mobley, 1982b).

Though turnover has its advantages it has to be controlled. A further understanding of the turnover process will enable us to achieve such a goal. Indeed, the purpose of this study was to (a) investigate the avoidance of completely voluntary turnover, (b) apply the literature on met expectations and efforts to change the situation in explaining turnover, and (c) examine the effects of met expectations and efforts to change the situation on product, test, process, applications, design, equipment, and software engineers.

Table 6

Correlation Matrix for expectations and experiences sub-scales.

	Expect 1	Expect 2	Expect 3	Expect 4	Expect 5	Expect 6	Expect 7	Expect 8	Expect 9	Expect 10	Expect 11
Experi 1	.27	—	—	—	—	—	—	—	—	—	—
Experi 2	—	-.21	—	—	—	—	—	—	—	—	—
Experi 3	—	—	.05	—	—	—	—	—	—	—	—
Experi 4	—	—	—	.03	—	—	—	—	—	—	—
Experi 5	—	—	—	—	.20	—	—	—	—	—	—
Experi 6	—	—	—	—	—	-.03	—	—	—	—	—
Experi 7	—	—	—	—	—	—	.15	—	—	—	—
Experi 8	—	—	—	—	—	—	—	-.12	—	—	—
Experi 9	—	—	—	—	—	—	—	—	.12	—	—
Experi 10	—	—	—	—	—	—	—	—	—	.31	—
Experi 11	—	—	—	—	—	—	—	—	—	—	.19

 $n = 31$ * $p < .01$

Summary of Results and Implications of Study

To stay competitive, high technology companies must be able to reduce turnover amongst what's rapidly becoming a scarce resource-- scientific and technical employees (Arpino, 1991). One way of retaining these individuals can be explained by looking at the literature on met expectations. Porter and Steers (1973) were the first to introduce this concept and in doing so they held that significant differences between what is experienced and what is expected lead to unmet expectations. Voluntary turnover, is in essence a byproduct of such unmet expectations.

The results of this study supports what Porter and Steers (1973) held. Indeed, employees experienced more unmet than met expectations. In general, employees had very high expectations on the 11 sub-scales of management, employee involvement and teamwork, communications, employee development, career advancement, performance appraisal, pay and recognition, benefits, work organization and operating efficiency, supervisor, and job security. Since expectations were so high, there was little variance for this variable. As a result, correlations between expectations and experiences were non-significant.

Retention of employees requires organizations to create an environment which closely matches what they expect and experience on the job. Clearly, the results of this study found discrepancies between these variables. For example, the greatest expectation which individuals had was that of pay and recognition and nevertheless it was associated with the fourth most negative experience. It was also found that the most positive experience was related to employee benefits despite its rating as the second least

important to their job. The implications of these findings is indeed tremendous for it implies that the organization is inadequately fulfilling important needs and sufficiently fulfilling the least important aspects of the job.

When expectations are unmet, as they were in this study, individuals will seek to change their situation. Efforts to change the situation include transferring, restructuring the job, restructuring responsibilities of the job, threatening to leave, or forcing someone else to leave. The results of employees' efforts to change the situation did not support the hypothesis of this study. People who had tried to change their situation were indeed successful 71% of the time.

One explanation for this outcome could be linked to what this variable actually measures. The efforts to change the situation only include those attempts that are internal to the organization. That is to say, external search behaviors are not measured by this variable. Models which have incorporated efforts outside the confinements of the organization focus on variables such as: perceived alternate employment opportunities, intention to search for alternatives, perceived existence of alternatives, intention to change positions, evaluation of expected utility of search and cost of quitting, search behaviors, and evaluation of alternatives (Arnold & Feldman, 1982; Mobley, 1977; Mobley et al., 1979; Steers & Mowday, 1981).

Another explanation for voluntary termination despite successful attempts at changing the situation could be linked to organizational changes at the time. Even though job security was the lowest rated expectation, employees stated that too many changes and not enough job security was one reason for voluntarily leaving the organization.

Changes in management were especially apparent in the organization and perhaps this can explain why the most negative experiences were those associated with management. Indeed, at times of change it is critical for organizations to keep employees informed about what changes are taking place and what the effects will be. The more the organization and management communicate with the employees, the less anxious and insecure they will feel.

The ultimate goal of examining turnover is to minimize its occurrence in organizations. In fact, avoidance of voluntary turnover is something that organizations should strive for however difficult it may seem. This study revealed that completely voluntary turnover was neither avoidable nor unavoidable for the organization. This gives credence to turnover as a natural part of organizational life.

Suggestions for Future Turnover Research

Employee turnover is complex in nature. There is no easy answer as to why people voluntarily terminate their employment. While this study showed support for met-unmet expectations, it countered the role of unsuccessful efforts to change the situation in the turnover process. Nevertheless, 87% of the employees actually tried to change their situation before terminating their employment.

Based on these findings, it is proposed to expand this variable to include employee behaviors outside the organization. Indeed, one of the reasons for voluntary turnover was the availability of better opportunities elsewhere. How would employees find a better opportunity elsewhere unless they had sought such opportunities? Clearly, more research needs to be done to gain a better understanding of employees' efforts to

change the situation both internally and externally.

While the findings of this study gave insight into employees' expectations and experiences in the organization, it's also important to recognize the limitations of the study. First, data were collected only on individuals who had left the organization. To further understand the role of expectations, studies should look at individuals who are about to join, who have been with, and who have left the organization. Second, importance was used as proxy measure of expectations and perhaps it can explain why such high scores were associated with this variable. Future studies should examine the relationship between what individuals hold important and what they expect out of a job. Maybe then we can gain a better understanding about importance as an indicator of expectations. Last, this study only included responses from 31 participants. Indeed, more research needs to be done which includes a larger sample size. That way the generalizability and trends in the organization can also be determined.

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Appendix A

TO: Parisa Sobhani
1700 Ridgetree Way
San Jose, CA 95131

FROM: Serena W. Stanford *Serena W. Stanford*
AAVP, Graduate Studies & Research

DATE: May 19, 1997

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Voluntary Turnover Among Engineers: A
Multivariate Analysis"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Serena Stanford, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.

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Appendix B

Below are a series of questions pertaining to your experiences at National Semiconductor Corporation. The questionnaire will take approximately 10 minutes to complete. Your cooperation is greatly appreciated in accurately responding to each of the statements and/or questions.

Please respond to these questions by circling the corresponding number on the 5-point scale below.

↓	↓	↓	↓	↓
1	2	3	4	5
Not at all important	Unimportant	Neutral	Important	Very important

How important were the following to how you felt about your job?

1	2	3	4	5	Management (practices, philosophy)
1	2	3	4	5	Employee involvement and teamwork (individuals having a say, degree of importance placed on working together and sharing knowledge)
1	2	3	4	5	Communication (two-way communication encouraged, company employees are informed of the vision, performance, and products)
1	2	3	4	5	Employee development (training opportunities at National)
1	2	3	4	5	Career advancement (job openings, career paths at National and practices)
1	2	3	4	5	Performance appraisals (knowledge of the process, manager involvement, fairness)
1	2	3	4	5	Pay and recognition (fairness and satisfaction in pay)
1	2	3	4	5	Benefits (satisfaction with benefits received)
1	2	3	4	5	Work organization and operating efficiency (understanding of job responsibilities, stability of work objectives, sufficient number of staff)
1	2	3	4	5	Supervision (recognition of work, supervisor is receptive, responsive, competent, available, helpful, manages and communicates well)
1	2	3	4	5	Job security (security of having a job)

Please complete these questions as if it were your last day on the job and circle the appropriate number on the 5-point scale below. If you can not decide about a statement or if it does not apply, mark "?".

↓	↓	↓	↓	↓
1	2	3	4	5
Agree	Tend to Agree	?	Tend to Disagree	Disagree

1	2	3	4	5	I was sufficiently informed about National's performance.
1	2	3	4	5	My supervisor managed people well.
1	2	3	4	5	The decisions management made concerning employees were usually fair.

1	2	3	4	5	I was satisfied with my involvement in decisions that affected my work.
1	2	3	4	5	I frequently worried about the future of my work group.
1	2	3	4	5	There was adequate opportunity for employees to learn about available job openings.
1	2	3	4	5	My supervisor was competent in the technical aspects of the job.
1	2	3	4	5	National's pay was as good or better than the pay in other companies in our industry.
1	2	3	4	5	My supervisor supported my training and development activities (i.e., gave me time and money).
1	2	3	4	5	The benefits of using ideas from other individuals, groups, and locations were recognized at National.
1	2	3	4	5	In my judgment, National as a whole was well managed.
1	2	3	4	5	There were sufficient opportunities for me to receive training to improve my skills in my job.
1	2	3	4	5	National did an excellent job of keeping employees informed about matters affecting us.
1	2	3	4	5	My work group operated efficiently.
1	2	3	4	5	National's benefits were as good or better than the benefits in other companies in our industry.
1	2	3	4	5	It was safe to speak up in this company.
1	2	3	4	5	National's management was interested in the well-being of employees.
1	2	3	4	5	My supervisor helped develop people's skills and abilities.
1	2	3	4	5	There was usually sufficient staff in my work group to handle the workload.
1	2	3	4	5	I was sufficiently informed about National's products.
1	2	3	4	5	People could challenge our traditional ways of doing things.
1	2	3	4	5	My supervisor gave me frequent feedback on my performance.
1	2	3	4	5	The training I had received at National adequately prepared me for the work I performed.
1	2	3	4	5	National's upper management provided a clear sense of vision and direction.
1	2	3	4	5	In my experience, sharing knowledge was encouraged at National.
1	2	3	4	5	My supervisor communicated effectively.
1	2	3	4	5	I had a reasonably good idea of my possible career paths at National.
1	2	3	4	5	I understood how my performance on the job was evaluated.
1	2	3	4	5	I was sufficiently informed about National's vision.
1	2	3	4	5	Innovative ideas could fail without penalty to the originating person or group.
1	2	3	4	5	Compared with other people performing similar responsibilities, I thought I was paid fairly.
1	2	3	4	5	National's benefits programs fit my needs.
1	2	3	4	5	I had a very clear understanding of my job responsibilities.
1	2	3	4	5	I frequently worried about the future of National.
1	2	3	4	5	I thought my performance on the job was evaluated fairly.
1	2	3	4	5	Priorities or work objectives were changed so frequently I had trouble getting my work done.
1	2	3	4	5	National usually promoted qualified company people before hiring people outside the company.
1	2	3	4	5	People got credit for supporting each other.
1	2	3	4	5	My supervisor seldom gave me recognition for work done well.
1	2	3	4	5	I could be sure of having a job with this company as long as I perform well.
1	2	3	4	5	There were sufficient opportunities for me to receive training to increase my eligibility for a better job.
1	2	3	4	5	My supervisor was available when needed.

Please respond to the following questions by check marking either "Yes" or "NO".

When you were unhappy with something about the job, did you try to:

	<u>YES</u>	<u>NO</u>
transfer (within National)?	_____	_____
change the job itself?	_____	_____
change your responsibilities?	_____	_____
threaten to leave?	_____	_____
force someone else to leave?	_____	_____

When you tried, were you successful at:

	<u>YES</u>	<u>NO</u>
transferring (within National)?	_____	_____
changing the job?	_____	_____
changing your responsibilities?	_____	_____
threatening to leave?	_____	_____
forcing someone else to leave?	_____	_____

Please respond to these statements by circling the corresponding number on the 5-point scale below.

↓	↓	↓	↓	↓
1	2	3	4	5
Strongly	Agree	Neutral	Disagree	Strongly
Agree				Disagree

- 1 2 3 4 5 The organization could have convinced me to stay.
 1 2 3 4 5 The factors influencing the decision to leave were beyond the organization's control.
 1 2 3 4 5 I would have stayed if things were better at the organization.
 1 2 3 4 5 The organization could have made changes which would have led me to stay.

Please provide the following information about yourself. All of the data provided will remain anonymous.

LAST JOB TITLE HELD AT NATIONAL:

AGE:

HIGHEST LEVEL OF EDUCATION:

____ B.A./B.S.
 ____ M.A./M.S.
 ____ Ph.D.

YEARS OF EXPERIENCE IN THIS FIELD: