This is to certify that the

thesis entitled

A comprehensive Theory of
Sexual harassment in the organization

presented by

James Michael Norris

has been accepted towards fulfillment
of the requirements for

MA degree in Psychology

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Date 9/6/85

A COMPREHENSIVE THEORY OF SEXUAL HARASSMENT IN THE ORGANIZATION

By

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Psychology

1985

ABSTRACT

A COMPREHENSIVE THEORY OF SEXUAL HARASSMENT
IN THE ORGANIZATION

By

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Sexual harassment has become a major issue facing organizations in the nineteen eighties. This thesis explores the problem of sexual harassment and builds a theoretical model of it. Based on past research, case studies, and interviews with subject matter experts, the mechanisms underlying sexual harassment are developed. A generic model of sexual harassment is presented and tested using traditional system dynamics techniques. The dynamics of relevant variables including stress, coping skills, social credit, and job performance are examined in detail.

The model emphasized the importance of supporting anti-harassment policies with continual reinforcement in order to gain the trust of victims and convince offenders that harassing behavior is not tolerated. The model was also able to explain performance increases reported by some victims and the nature of the relationship between stress and performance was clarified.

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I. INTRODUCTION

> My name is Maxine M_____. On January 26, 1976 I was hired by J. T. Barnes and Company as assistant manager to the collection department. On Friday, February 13 of the same year, 1976, I was fired from that particular job for refusing to go to bed with my boss. (Curran, 1979, p. 34)

Sexual harassment has become a major issue facing organizations in the nineteen eighties. This thesis explores the problem of sexual harassment and builds a theoretical model of it. Based on past research, individual case studies and interviews with subject matter experts, the mechanisms underlying sexual harassment are developed. A generic model of sexual harassment is presented, and tested by traditional system dynamics model validation techniques. This section discusses the importance of sexual harassment as a research topic in terms of its pervasiveness and resultant costs. Advantages of the system dynamics approach to the study of sexual harassment are also presented. Conceptual and measurement issues facing the researcher in the areas of sexual harassment and system dynamics are explored. The construct of sexual harassment is defined, and its effect on other variables is described. Finally, other variables relevant to the discussion of a dynamic representation of sexual harassment are introduced.

Importance of Sexual Harassment

Data from surveys suggest that the majority of women have been victims of sexual harassment (Safran, 1976).

While hardly a new phenomenon, the subject of sexual harassment received little public or academic attention until a 1976 survey published in Redbook (Safran, 1976) found that over ninety percent of the respondents had experienced overt physical sexual harassment. Since the appearance of this pivitol article, sexual harassment has received a great deal of media attention. Many organizations now have explicit policies regarding sexual harassment (e.g. Control Data Corporation, University of California at Chico, and the State of Illinois).

Articles concerning sexual harassment also began to appear in the practitioner press (e.g. Faucher & McCulloch, 1978; Somers & Clemetson-Mohr, 1979). Most of these attempted to define the problem and explain the legal context and current judicial interpretations. Methods of dealing with harassment and the establishment of employer policies were also usually discussed. No attempt was made to understand the problem or submit hypotheses to rigorous research. The academic community was somewhat slower in responding to the problem, but the issue is growing in popularity as a research topic. Recently, an entire issue of Journal of Social Issues (Brewer & Berk, 1982) was devoted to sexual harassment.

Sexual harassment has been linked, both theoretically and empirically, to psychological and physiological stress, often accompanied by somatic symptoms such as headaches, nausea, and loss of concentration, as well as decreases in

job performance and increased absenteeism and turnover. In one study of federal employees, twenty-nine percent of the 20,083 randomly stratified respondents (see Tangri, Burt, & Johnson, 1982, for a description of this sample) reported that sexual harassment had negatively affected their psychological health (United States Merit Systems Protection Board, 1981). Aside from the undesirability of these problems from a humane standpoint, these variables carry attendant dollar costs.

Mobley and Hall (1973) found that costs associated with turnover in the first eight weeks of a training program for fiber manufacturing operators were approximately $1000 per employee. Similarly, the replacement of one bank teller can cost $2500 (Mirvis and Lawler, 1977). These cost estimates are low, however, when compared to those observed in other occupations. For example, the reenlistment of one high school graduate costs the U.S. Navy nearly $100,000 (Huck and Midlam, 1977).

The effects of sexual harassment go much further than just turnover. In fact, over a two year period, the United States Merit System Protection Board (USMSPB, 1981) estimated losses due to sexual harassment were in excess of $189 million in the federal government alone. This figure was determined using estimation techniques similar to those of Mobley and Hall (1973) and included costs associated with turnover, medical insurance claims, absenteeism, and reduced productivity. In addition, increased awareness by women of

grievance avenues has led to a rise in costs due to lawsuits and out-of-court settlements. As awareness of the costs and consequences of sexual harassment increases among victims and the judiciary, one might expect costs in the areas of grievances and lawsuits to rise.

Usefulness of the System Dynamics Approach

Most of the research being conducted in organizations today emphasizes statistical analysis of data. But as Levine (1983) points out, statistical models are often misrepresented as process models rather than as a data organizing tool for pointing out relationships between variables. Another difficulty is the limited ability to interpret the dynamics of models containing many independent variables. Five- and six- way interactions test the limits of interpretability of analyses of variance. Unfortunately, most systems encompass a large number of variables.

These problems have not gone unnoticed in industrial/organizational psychology. Cummings (1978) notes simulation will become an increasingly useful tool in organizational research because of the modeler's ability to collapse the time intervals necessary for dynamic models. Weick (1979) observed that people are active participants in their environment. People do not merely react to their environment, they also shape it by their actions. However, interactions between individuals and their environment are rarely reported in field research (Terborg, 1981). Another problem with traditional methodology lies in the limited

information obtained from tests of significance of differences (Richardson & Pugh, 1981). The systems approach attempts to circumvent these shortcomings.

Thinking in terms of systems is as old as humanity. A system can be described as "a collection of interacting elements that function together for some purpose" (Roberts, Anderson, Deal, Garet, & Shafer, 1983, p. 5). A model is a representation of the system. Most of the models people use in actual life are quite simple. For example, when one feels pangs of hunger, food is sought to satisfy that need. Having eaten, the person is sated and life goes on until hunger strikes again. Simple models like this one are easy to understand.

But problems arise when looking at very large systems that may encompass hundreds of variables. Cognitive theorists have learned that most people can only process about seven pieces of information at one time (Miller, 1956), yet a system (such as an organization) may be composed of hundreds of variables. Normally, it is not humanly possible to understand the interactions of that many variables. It was for this reason that systems science was developed. The use of systems was pioneered by those in the natural sciences in the early 1930's. Bertalanffy, a biologist turned systems theorist, used systems thinking to understand the organisms he observed. Researchers at MIT used systems theory for military applications. Systems scientists, realizing that their models contained many of

the same structures, began to examine other systems outside their traditional area of study. The field of cybernetics was thus born. Forrester's (1961) applications of cybernetics to industrial problems formed the basis for what is now called system dynamics. Through the use of the computer, the systems researcher is able to understand truly complex social and economic systems.

Thomas and Tymon (1982) note that the methodologies currently being used in the organizational sciences are commonly criticized as overly concerned with description, internal validity, reductionism, and statistical techniques. In addition, they noted complaints that psychology's overreliance on some aspects of the scientific method often leads to commonsensical results that are of no relevance to the practitioner. While passing the test of rigor, results of this nature serve only to cast doubt on the role of psychology as a science, while doing little to increase the credibility or the body of knowledge in the field.

A systematic model of science has been proposed by Mitroff and others (Mitroff, 1977; Mitroff, Betz, Pondy and Sagasti, 1974; Mitroff and Turoff, 1974) that attempts to deal with these problems. Theirs is an iterative problem-oriented approach which considers problem perception and conceptualization, model formulation, and policy analysis. A main feature of the Mitroff approach is its problem orientation, emphasizing research relevant to the practitioner. System dynamics uses an approach similar to

the one developed by Mitroff and his colleagues. One example (Roberts et al., 1983) of this approach is outlined in Figure 1 and discussed in greater detail later.

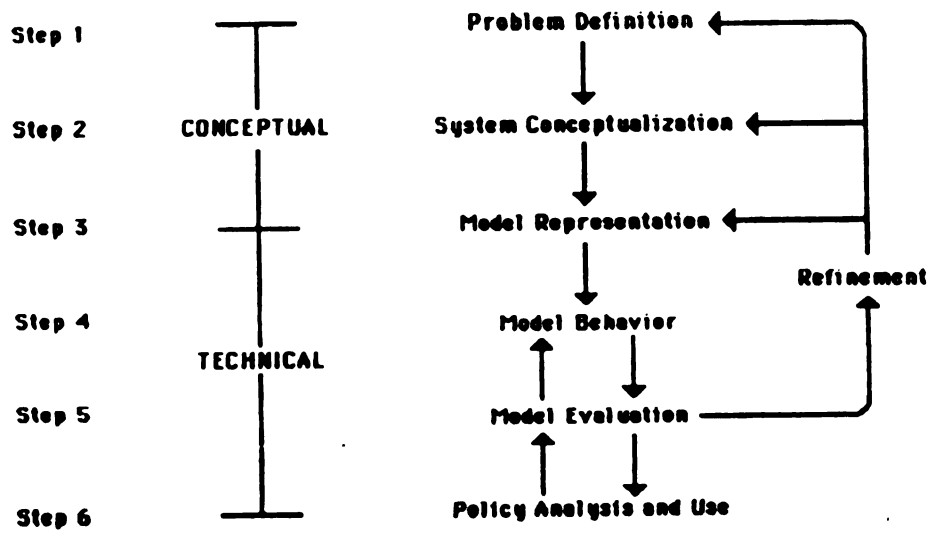

Figure 1. Phases in the model-building process. (from Roberts et al., 1983, p. 8)

A second advantage of the system dynamics approach over more traditional social science methodologies lies in the modeler's ability to simulate model behavior over any time length by exploring the feedback mechanisms. Time and financial considerations often preclude the use of longitudinal research. The result is an overreliance on cross-sectional data collection, which if interpreted incorrectly can lead to very inaccurate conclusions.

For example, intelligence was thought to decline dramatically with age. In a study done by Doppelt and Wallace (1955) average IQ dropped from a high of 110 at age thirty to a low of 65 at age eighty. But, it was unclear if

intelligence actually decreased with age or if educational deficits had adversely affected older people's scores (Anastasi, 1983). Data from longitudinal studies support the latter argument: The scores of individuals retested over periods of five to forty years tended to increase (cf. Anastasi, 1983).

Anastasi (1983) cites other studies (e.g. Baltes, 1968; Buss, 1973, Goulet & Baltes, 1970; Nesselroade & Reese, 1973; Schaie, 1965) that point out methodological problems preventing conclusive interpretations of results obtained from both cross-sectional and longitudinal data. System dynamics, on the other hand, uses the notion of cause and effect inherent in feedback loops to explore the mechanisms underlying the system so that a basic understanding of the system is possible, simplifying interpretation.

The empirical nature of system dynamics modeling is another factor making this technique useful for the practitioner. Empirical research has come to imply research based on statistics. Empiricism does include much more than just statistics, however. Forrester and Senge (1980) note that statistical analyses are not the only way to empirically validate a model. They define validation as the process of developing confidence in the behavior of the model as an indicator of actual system behavior. This includes the notion of operational validity discussed by Thomas and Tymon (1982), which concerns the modeler's ability to implement model-suggested policies by

manipulating causal variables.

Model validity is determined by the modeler's and target audience's confidence in the representativeness of the model (see Brunswik, 1956). Traditionally, the criterion in determining the validity of psychological research has been some abstract truth, but Forrester and Senge (1980) point out that there is no method for proving the correctness of any model. Instead, they claim model confidence and usefulness are the criteria that should be considered. For example, Einstein's theory of relativity and Darwin's theory of evolution have yet to be proved, but these models are very useful tools for understanding the world around us.

An absolutely true model would be so large as to be cumbersome and expensive. If one wishes to drive to a nearby town, for example, a county or state highway map would be the most useful model. A model that exactly duplicates reality (and hence is absolutely true) would be an identical replica of the route the driver would follow between the towns. Every blade of grass and every rock would be represented. But all the grass and rocks are irrelevant to the driver trying to find another town. A similar problem of a different magnitude exists for the person using a state map to find a house in a subdivision. The state map provides too little information. The correct level of detail for the driver and the system dynamicist is determined by clear definition of the problem.

In short, system dynamics is an empirical methodology that represents a problem as a part of the system in which it exists. The researcher is able to simulate a system over time and observe its operation. The mechanisms that cause the problem are delineated, increasing the understanding of its etiology and behavior. Various policies can be simulated and their effects uncovered before any change is actually implemented. In this way alternative policies can be tested and objectively compared. Those in decision-making positions are then able to make more informed decisions.

Purpose of this Study

This study reviews the various theoretical conceptualizations of sexual harassment. Individual, interpersonal and task variables linked to harassment are reviewed, and cause and effect relationships between these variables are explored. A number of specific variables with hypothesized or empirically determined relationships to sexual harassment are detailed using information derived from the literature, subject matter experts, and victim case studies. These variables then serve as a base for the system dynamics model of sexual harassment developed and tested in Chapters IV and V. Methods for constructing, measuring and validating the model and the dynamic hypotheses underlying it are described. Policy implications based on model behavior are then discussed.

Due to the nature of sexual harassment, traditional

experimental research designs are inadequate. Cross-sectional and correlational data may give misleading causal information; longitudinal designs are undesirable because of ethical considerations; and correlational designs are unwieldy with nonlinear relationships between variables. Also, none of these designs permit the determination of potential intervention points or investigation of system behavior under different policies. This study is one of the first to unify the past research and empirically consider sexual harassment in terms of its underlying mechanisms. Like much of the previous research, it goes beyond simple definition of the problem and listings of court cases. This paper differs, however, in that it empirically defines the antecedents and consequences of the problem, as well as the relationships between these variables; it explains the causal mechanisms underlying sexual harassment within the organization.

Summary

This chapter introduced the concepts to be examined in this paper: sexual harassment within an organizational systems framework. It articulated the moral, psychological and economic importance of understanding the mechanisms underlying sex harassment. It also presented the unique contributions offered by the proposed paper with respect to both psychological and methodological concerns. Finally, it briefly stated the purpose and procedures of this inquiry.

II. REVIEW OF THE LITERATURE

This chapter reviews the relevant literature on sexual harassment and system dynamics. Various definitions of sexual harassment are given, and a single definition is chosen for this study. Four major theories of the causation of sexual harassment (Tangri, Burt, & Johnson, 1982; Gutek & Morasch, 1982) are discussed. The importance of perceptions of harassment behaviors are also examined. The antecedents and consequences of sexual harassment, as defined by previous research, victims, and experts are reviewed. Finally, system dynamics models of Milgram's (1965) conformity experiments and the introduction of minorities into management (Frohman, Morgan, & Pugh, 1978) are examined. The similarities between the dynamics of these models and the problem of sexual harassment are presented.

The Sexual Harassment Construct

Definitions of Sexual Harassment

Many definitions of sexual harassment have been given. One of the earliest (Farley, 1978) characterized sexual harassment as

> unsolicited nonreciprocal male behavior that asserts a woman's sex role over her function as a worker. It can be any or all of the following: staring at, commenting upon, or touching a woman's body; repeated nonreciprocal propositions for dates; demands for sexual intercourse; and rape. (p. 1)

However, problems arise with this definition because of the exclusion of men as victims. H. P. Curran (personal

communication, January 11, 1984), Director of the Office of Women and Work, Michigan Department of Labor, states that an increased number of men are complaining of sexual harassment, usually of a homosexual nature. Also, this definition excludes such behaviors as lewd jokes, exhibitionism, and unwanted exposure to pornographic literature and pictures. Other definitions of sexual harassment currently in use by organizations are presented in Table 1.

For several reasons, the definition employed by the Equal Employment Opportunity Commission (see Table 1) is used to define sexual harassment. First, this definition views sexual harassment within the context of an organization, as does the system dynamics model of sexual harassment developed in this thesis. Second, all the behaviors defined as sexually harassing by various victims (e.g. Powell, 1983) can be subsumed under this definition. Finally, the persual of legal grievance avenues requires evidence that sexual harassment, as defined by the EEOC, has occurred. While none of these definitions is central to the development or testing of a dynamic model, they do provide the reader with a framework from which to understand sexual harassment.

Four Theories of Sexual Harassment

Attempts to explain sexual harassment have fallen into four main categories: the natural/biological, the organizational, the socio-cultural (Tangri et al., 1982);

Table 1. Definitions of sexual harassment.

Equal Employment Opportunity Commission
"Unwelcome sexual advances, requests for sexual favors and other verbal and physical conduct of sexual nature." (Hoyman, unpublished, p. 13)

National Advisory Council on Women's Educational Programs "The use of authority to emphasize the sexual identity of a student in a manner which prevents or impairs that student's full enjoyment of educational benefits, climate or opportunities." (Till, 1980)

University of Washington
"...unwelcome sexual advances, requests for sexual favors or other verbal or physical conduct of a sexual nature carried out by someone in the workplace or educational setting. Such behavior may offend the recipient, cause discomfort or humiliation and interfere with job or school performance." (Somers, 1982 p. 26-27)

California State University, Chico
"...[abuse of] a position of power or authority over a student to impose unwanted sexual cooperation...interferes with a student's work performance and creates an atmosphere of intimidation and hostility...." (Somers, 1982, p. 27)

United State Office of Personnel Management
"...deliberate or repeated unsolicited verbal comments, gestures, or physical contact of sexual nature which are unwelcome." (Powell, Benzinger, Bruno, Gibson, Pfeiffer, & Santopietro, 1981)

Catherine MacKinnon
"The unwanted imposition of sexual requirements in the context of a relationship of unequal power." (1979)

Cornell Study
"Any repeated and unwanted sexual comments, looks, suggestions or physical contact that you find objectionable or offensive and causes you discomfort on your job." (cf. Farley, 1978 p. 39)

and the spillover approach (Gutek and Morasch, 1982). These orientations have been developed from research, court cases and legal defenses (Tangri et al., 1982).

The Natural/Biological Theory

The natural/biological approach is based on the assumption of natural attraction between people. One position holds that men have stronger sex drives and express it in the workplace when women are around. Another version posits that people in general have sexual needs and will attempt to develop sexual relations with others in the workplace. In the latter version, sex drives are seen as equal for males and females. Court rulings supporting this argument (e.g. Bundy v. Jackson, 1981; Dothard v. Rawlinson, 1977) insist that sexual harassment is only the manifestation of this sexual attraction. The harasser means no harm. Still another version the of natural/biological approach holds that it is only a few "sickos" who are harassing women (Corne & DeVane v. Bausch & Lomb, 1975). Tangri et al. (1982) note that the natural/biological explanation serves to minimize the importance of harassment as a problem while simultaneously accepting harassment as a natural phenomenon to be expected in organizations.

The Organizational Theory

The organizational view of sexual harassment holds that organizational variables such as organizational structure, status differentials and organizational climate promote sexual harassment. Because of promotion and termination

power over their subordinates, bosses may coerce subordinates into unwanted sexual relationships. H. P. Curran (personal communication, January 11, 1984) and others (e.g. Curran, 1979) reported an increased number of complaints from individuals as they neared the end of a probationary period in a new job. These people could be fired without explanation during this period, and many felt they could not afford to lose their jobs.

The Socio-Cultural Theory

The socio-cultural interpretation of sexual harassment is based on the premise of a male-dominated society further attempting to keep women from attaining economic, political and social power. Men are in positions of status and power and do not want to share them. Supporters of this view maintain that forcing women to engage in unwanted sexual attention increases the power of the harasser. At the same time, the victim's role as worker is downplayed. She is viewed as a sex object and not as a member of the workforce. Sexual harassment, adherents of this theory claim, maintains the status quo by intimidation, discouragement and the objectification of women (Tangri et al., 1982).

Tangri et al. (1982) examined these three conceptualizations of harassment using data obtained from the United States Merit Systems Protection Board (1981). They found that none of the three theories seemed to adequately represent the dynamics of sexual harassment. They were much too simple to account for the myriad

interactions in the system (Tangri et al., 1982).

For example, the natural/biological version would assert that because sexual harassment is a result of natural attraction, victims would be singled out by their attractiveness. In their analysis of the Merit System Protection Board data, Tangri et al. (1982) found that only a few people report being the sole object of their harasser's sexual attention. Additionally, this version would suggest that harassers would likely be the same age and social level as their victims. They found, however, that those who harassed women tended to be older than their victims, while those harassing males were younger, particularly in the case of women harassing men.

The organizational representation of sexual harassment can be faulted for several reasons. Most harassers are coworkers (Tangri et al., 1982), and not superiors as this theory would predict. This approach would also predict that work-group size and privacy of workspace would have an effect on the incidence of harassment. This relationship was not supported by Tangri et al.'s research. The socio-cultural theory of sex harassment can be similarly faulted. It holds that harassment is a tool to "keep women in their place" both economically and in organizational status. Supporters of this perspective would then expect an organization to respond negatively to harassment complaints. In fact, only a very small percentage of sex harassment victims reported a hostile response. Formal action was

often more effective at stopping the harassment than the victims had expected (Tangri et al., 1982).

The Spillover Theory

The spillover approach proposed by Gutek and Morasch (1982) maintains that role expectations on the job are a function of the sex-roles of the numerically dominant sex. For the nontraditionally employed woman this means that she is expected to act according to the weltanschauung of her superiors and coworkers. She is viewed first as a woman, then as a worker. Her sex-role and work-role are incongruent, which is a possible explanation for the increased number of harassment incidents reported by women in nontraditional jobs (Gutek & Morasch, 1982). Almost twenty-one percent of women in nontraditional work have quit a job during their working life because of sexual harassment (Gutek & Morasch, 1982).

While reporting less harassment, women working in traditional jobs are not immune to it (Gutek & Morasch, 1982). By their nature, traditional jobs tend to be sex-segregated and reinforce the expectations of sex-role behavior. The sex-role and the work-role become equivalent. Women holding these kinds of jobs are expected to act in stereotypical fashion. The sexuality of women is one dimension that spills over from sex-role to expected job behavior. Sexual harassment is less a problem for these women because they see it as part of the job.

One victim noted that, even though she was forced to

have sex with her boss, she was not being harassed because all the women on the job had to sleep with him (Farley, 1978). Gutek and Morasch (1982) argue that awareness of sexual harassment arises from the knowledge that one is being treated differently than other workers. This would explain why women in nontraditional jobs report more harassment than traditionally employed women. Still, the sex-role spillover approach does not explain harassment for all women in all jobs.

In an integration of the three explanations of Tangri et al. (1982) and that of Gutek and Morasch (1982), Brewer (1982) noted that for women working in traditional job settings, the organizational approach best explains sexual harassment. Traditional jobs are more likely to have larger power and status differentials between the sexes and an organizational climate that condones or encourages sexual harassment. The socio-cultural version of harassment is most applicable to women in nontraditional jobs where men may be trying to assert traditional sex-role relationships. The biological representation most closely corresponds with the situation encountered in an integrated work setting where social-sexual attention is seen as an extension of normal, mutual sexual attraction.

Perceptions of Sexual Harassment

Not all behaviors subsumed under the EEOC definition of sexual harassment are construed as sexual harassment by all people. Men and women often perceive the same acts

differently (Collins & Blodgett, 1981; Gutek, Nakamura, Gahart, Handschumacher, & Russell, 1980). And women themselves vary in their categorization of behaviors depending on such factors as managerial level (Collins & Blodgett, 1981) and sex-role identification (Storms, 1979). While recognition of sexual harassment as a problem is necessary for action to be taken, lack of awareness does not obviate the effects of harassment. H. P. Curran (personal communication, January 11, 1984) and Brewer (1982) noted that harassing behaviors may have a negative impact on women regardless of whether or not they classify that behavior as harassment.

In a study by Powell (1983), women saw more harassment than men in two thirds of the harassment categories. Behaviors intended to be complimentary and/or sexually oriented were seen as harassment more often by women. Gutek et al. (1980) found similar results. Eighty-four percent of the women they sampled believed that conditional dating constitutes sexual harassment. Seventy-five percent of the men agreed. The most pronounced difference in perceptions was for non-verbal social-sexual behaviors (e.g. looking, leering, gestures, touching and brushing against): roughly sixty-five percent of the women regarded these behaviors as harassment while only thirty-five percent of the men did so.

Powell (1983) posited an interaction between sex and sex-roles that affects perceptions of harassing behaviors. Although both masculine and feminine traits are possessed by

all individuals, the more a person exhibits traits and behaviors characterized as feminine (using the short version of the Bem Sex-Role Inventory, Bem, 1974, 1975), the more likely he or she would be to classify sexually oriented behavior as sexual harassment.

He found no support for the notion that those individuals with nontraditional sex-roles would perceive more behaviors as harassing than those with more traditional sex-roles. The more feminine traits one exhibits, the more likely one is to perceive sexual harassment. Levels of masculinity do not appear to be a factor, though. While sex-roles do seem to be an important determinant, gender does not not appear to matter when an individual is classified as either masculine or feminine. Only for those people classified as androgynous (high in masculinity and femininity) or undifferentiated (low masculinity and femininity) were sex differences found. That is, androgynous or undifferentiated women see more sexual harassment than androgynous or undifferentiated men.

There also appears to be some support for the notion of the traditional managerial sex-role identification (high masculine and low feminine scores) as decreasing the number and kinds of behaviors viewed as sexually harassing (Powell, 1983; Powell & Butterfield, 1979). Again, this is most likely due to the low femininity scores rather than the high levels of masculinity.

Additionally, sexual identity or orientation was

determined to have an effect in labeling various social-sexual behaviors (Schneider, 1982). More of the subtle forms of harassment were perceived as harassment by lesbians than by heterosexual women. The response distributions were more negatively skewed for the lesbian group: Heterosexual women showed much greater variability in their responses to harassing behaviors. However, Schneider notes that feminist orientation may be a more important factor than sexual identity. Those heterosexual women who identified themselves as "extremely feminist" display a response pattern very similar to that of the lesbian women. It is plausible that lesbians willing to publicly espouse their sexual identity are more likely to hold feminist views.

The relative status and power of the harasser plays a role in the categorization of behaviors. The greater the status differential between the initiator and the victim, the less likely the mild forms (e.g. sexual jokes, leering) of harassment would be classified as such (cf. Brewer, 1982). However, when the initiator of harassment is perceived to have social or organizational power over the individual, a sexual advance will more often be viewed as an abuse of power (Brewer, 1982). For example, in an academic setting where the power differential is very apparent, professors' advances are not well received (Schneider, 1982). But when considering the social-sexual behaviors of airline personnel, Littler-Bishop, Seidler-Feller, and Opaluch (1982) found less negative affect to supervisory

harassment than coworker harassment. The status differential between harasser and victim was perceived to be smaller by the airline employees than by the students.

In the latter situation, Brewer hypothesized that any positive affect gained because of the instructor's status and resulting social exchange would be offset by the perceived abuse of power. She believes the relationship between the size of the status differential and the perception of sexual advances as harassing behavior to be curvilinear. Overtures from someone with slightly more status will be perceived positively because of social exchange (i.e. "I look better when I am with him or her"). Large status differences, on the other hand, will also be perceived as large power differences (Brewer, 1982), resulting in a perception of the overture as an abuse of power.

Demographic factors are an additional source of variance in beliefs about harassment (cf. Gutek, 1983). More highly educated women took greater offense to propositions at work than less educated women. They are also less likely to believe that women are seductive at work, invite propositions, and like being propositioned. In general, those women who are more highly educated tend to attribute sexual harassment to sex-roles while less-educated women impute harassment on a woman's dress or actions.

Marital status was found to moderate women's perceptions of harassing behaviors as well (Gutek, 1983).

Separated women were more likely to believe that women liked sexual overtures at work, while those who had never married were not at all flattered. Divorced women believed that women do act sexy at work, while those living with a man thought it was sex-roles that encouraged men to make advances.

Ethnicity is another variable found to influence perceptions about harassment (Gutek, 1983). In general, non-white women were less traditional in their beliefs about harassment than white women. Minority women were less likely to believe that women like being propositioned, act sexy at work, and initiate sexual overtures at work.

Finally, Gutek (1983) noted that organizational climate or ambience plays a role in determination of harassing behaviors. Increased engagement in cross-sex social talking tended to relax views about sexual behavior. In this case, individuals are more often flattered by propositions and perceive coworkers as feeling the same way. They also think that women dress and act more provocatively while at work.

When physical appearance is important on the job, both sexes report increased "sexy" activity. Those working in this kind of environment are more likely to report that people enjoy being propositioned. However, respondents do not include themselves with their coworkers. They are no more flattered or complimented by propositions than workers in jobs where appearance is less important. Those working in environments that foster flirting are more likely to

report that sex-roles encourage members of the opposite sex to proposition members of their sex.

Gutek (1983) concludes by stating that men and women tend to agree about men's perceptions of sexual behavior at work. They do not agree, however, on individual women's perceptions: "...women do not like sexual advances at work" (Gutek, 1983, p. 13). While they perceive other women as being flattered by propositions, most women report that they are not. Similar findings are reported by Schneider (1982).

Women's harassment history was also shown to effect perceptions of the seriousness of sexual harassment (Powell et al., 1981). Fifty percent of those who had been harassed, compared with only twenty-five percent of the non-harassed women, thought sexual harassment was a serious problem. Powell et al. (1981) believe that many of the definitions of sexual harassment used by organizations and government do not match those being used by women. While most everyone in their sample agreed that deliberate touching, grabbing, and brushing against were unacceptable behaviors, their sample disagreed among themselves as to whether verbal comments and gestures were harassing behaviors. Few of their subjects would feel harassed when stared at. These behaviors are encompassed in Farley's (1978) definition and many of the definitions included in Table 1 (e.g. the sexual harassment definitions used by the University of Washington, EEOC, the Cornell Study, and the U. S. Office of Personnel Management).

Although the amount of sexual attention received did not appear to affect women's definitions, those women who felt they had been harassed were not appreciative of sexual attention (Powell, et al., 1981). Women who had not experienced sexual harassment were less averse to sexual attention on the job. Because of different individual definitions and the social undesirability of being a harassment victim, harassment may go unreported. This is especially true for those incidents not involving actual physical contact. There is strong pressure from other workers, both male and female, not to report the incident. Powell, et al. (1981) believe that the effectiveness of even the best sexual harassment policies will be less than desired because of this pressure.

Antecedents and Consequences of Sexual Harassment

Sexual harassment exists within a dynamic framework of many variables. Many of the antecedents and consequences of sexual harassment actually moderate the likelihood and the results of sex harassment rather than act as a direct cause or effect. Nevertheless, their impact on the system makes their consideration worthwhile.

Antecedents of Sexual Harassment

Very little, if any, research has been conducted that directly examines the harasser and his or her motivations (Brewer, 1982). And while management responsiveness has been shown to be related to recognition of harassment (Tangri et al., 1982), little has been done in this area.

The conceptualizations suggested by Tangri et al. (1982) and Gutek and Morasch (1982) represent four attempts to explain why harassment exists and who the victims might be. But as Brewer (1982) pointed out, none of them adequately explains sexual harassment in variety of settings.

Nevertheless, data from the Merit System Protection Board (1981) do reveal several factors that appear to be associated with sexual harassment (see Table 2). Age, marital status, gender, traditional nature of the job, sexual climate of the job, sex composition of the job, traditional sex-roles, availability of grievance procedures and job alternatives were found to be linked to reported incidents of harassment (cf. Tangri et al., 1982). Workspace privacy, shifts worked, or work-group size were not found to have any relationship to level of sex harassment. As noted above, difficulties arise in interpreting some of this information because of differences among victims in their perceptions of what constitutes sexual harassment.

Gender was found to be major influence on the incidence of harassment. For all types of harassment, women report more experiences than do males. Tangri et al. (1982) found that forty-two percent of women respondents, compared with only fifteen percent of male respondents, reported being sexually harassed in the previous two years. Married women reported less (37%) than single (53%) and divorced (49%) women. Trainees reported high levels of sexual harassment

Table 2. Antecedants of sexual harassment.

Victim Factors	Organizational Factors
Age	Sex composition of job
Sex	Type of job
Marital status	Sexual climate
Sex-roles	Availability of grievance
Job alternatives	procedures
Education	Sexual harassment climate
Tenure	Nature of job
Job status	(traditional,
Need to keep job	integrated, or nontrad-
Pioneer	itional for victim)
Race	

Harasser Factors
Sex
Race
Age
Job status
Sex-roles
Marital status
Views of women

(51%), but little support was found for the notion of vulnerable job categories.

Tangri et al. (1982) found the relationship between job status and sexual harassment to be negative for men and almost nonexistent for all women, excepting those in very high level positions. They also found that although educational level was found to be positively related to the reported incidence of harassment, income was not. Those persons whose positions were more tenuous complained of high levels of harassment (also Hoyman, unpublished). Of those that expressed a strong need to keep their jobs, more than sixty percent claimed to be victims of sex harassment. Also, forerunners in their respective fields reported more harassment, although this trend was much stronger for women than for men.

Harassers, for the most part, are men. Other than this fact, the profile of the typical harasser is sketchy. As Brewer (1982) observed, current research tends to concentrate on victims and their descriptions of harassers. Data from the USMSPB do reveal some information about them, however (Tangri et al., 1982). Nearly eighty percent of the respondents reported males as their only harassers. Ninety-five percent of the women reported being harassed by men, two thirds of whom were married. Most harassers are of the same race as their victims, although women are more often harassed by members of other races. Additionally, harassers are usually older than their female victims.

Coworkers are the most common perpetrators of sexual harassment (65% for women, 76% for men), although supervisors are much more likely to harass women. Subordinate harassers are less of a problem for women (4%) than for men (16%). Even though supervisors account for only about one third of harassment of women, social and cultural power differentials may still be important (Tangri et al., 1982). For example, the woman may work as part of a team and rely on the assistance of her coworkers. Also, there may be an "old boy" network to which the harassing coworker may belong (H. P. Curran, personal communication, January 11, 1984). The use of power in these situations is subtle and most closely approximates that described in the socio-cultural model (Tangri et al., 1982). In addition, unchecked coworker harassment may leave the impression that the organization condones and even encourages harassing behaviors.

Organizational factors may have a part in determining levels of sexual harassment at work (Gutek & Morasch, 1982). Hoyman (unpublished) found that those holding jobs at either end of the status spectrum experienced more harassment. This would support Gutek and Morasch's (1982) hypothesis about sex-role spillover. Blue collar jobs tend to be male dominated, as do white collar jobs. By virtue of the nontraditional sex-roles held by women in these jobs, one could expect that more harassment would be reported. It is difficult to discern if there is in fact more harassment or

if these women perceive more behaviors as sex harassment (Hoyman, unpublished).

Consequences of Sexual Harassment

A great deal more research has been conducted on the aftereffects of sexual harassment than on its origins. Some of the consequences that have been suggested in the literature are presented in Table 3. These tend to be most severe for the victim, but secondary consequences are passed on to all members of society in terms of higher insurance rates, unemployment, and lost productivity (Tangri et al., 1982). The impact of sexual harassment on the families and friends of victims has been noted but not researched. Interestingly, many of the same symptoms suffered by sexual harassment victims may be found in victims of organizational burnout (see Rubin, 1982).

Although most women are angry and disgusted (Curran, 1979; Jensen & Gutek, 1982; Silverman, 1976), fear and intimidation prevent many of them from confronting their harassers or pursuing grievance avenues (Curran, 1979; Silverman, 1976). Guilt and embarrassment are also commonly experienced by sexually harassed women (Curran, 1979; Jensen & Gutek, 1982; Silverman, 1976). These feelings, combined with self-blame (Jensen & Gutek, 1982) and social pressure, can also prevent the harassment victim from challenging the harasser. Harassed women commonly do not want to cause any problems for their harasser (USMSPB, 1981). One victim testifying before the Michigan Department of Labor stated

Table 3. Consequences of sexual harassment.

Individual Level

Attitudinal and Affective
Guilt
Embarrassment
Fear
Intimidation
Job involvement
Feelings of incompetence
Tension
Impaired self esteem
Anger
Disgust
Distractibiliy
Dread to work
Self blame
Sadness
Depression
Decreased motivation
Fear of harming status of harasser

Health-Related
Humiliation
Headaches
Nervousness
Insomnia
Attempted suicide
Weight loss
Obesity
Hypertension
Nausea

Work-Related
Transfer
Discharge
Poor Evaluation
Not promoted
Turnover
Demotion
Not hired
Absenteeism
Tardiness
Decreased productivity
Decreased ability to work with others

Organizational
Increased costs
Turnover
Decreased effectiveness

Interpersonal
Strained relations with family
Distrust of others at work
Blaming other other victims

Societal
Degradation of women
Perpetuation of faulty value systems

Harasser
No consequence
Discharge
Resignation
Negotiation
Suspension
Demotion
Promotion

that

> I am afraid if I complain, he will lose his job. He has 3 children and if he loses his job because of me, none of the workers in the office will talk to me again. (Curran, 1979, p. 11)

A woman who does speak out risks being labeled as an agitator and a "complainer" (Renick, 1980) and will often lose the support of other workers (Jensen & Gutek, 1982). Many women, particularly those with traditional sex-role beliefs, attribute the harassment received by other women to sexy dress or behavior (Jensen & Gutek, 1982). As as result of all of the feelings outlined above, the woman may begin to believe that performance previously judged as being good was based on her looks or sexual qualities, rather than on her ability as a worker (Benson & Thompson, 1982). Her feelings of competence about her ability to perform the job may then suffer (Benson & Thompson, 1982). Self-esteem may also plummet because of self-blame, perceived incompetency, and lack of support from other workers (Curran, 1979).

The stress resulting from sexual harassment can have devastating physical and psychological effects. Over ninety percent of those who had experienced sexual harassment reported increased stress levels (Crull, 1978; Curran, 1979). Twenty-nine percent of the victims reported that sexual harassment has negatively affected their psychological well-being (Curran, 1979). Similar results were reported by Tangri et al. (1982), with women reporting more negative effects (33%) than men (21%). Somatic complaints such as headaches, nervousness and nausea are

common (Jensen & Gutek, 1982). Sleeplessness, dramatic weight gains and reductions, hypertension, and depression are also routinely reported.

Additionally, because harassment is often attributed to behaviors of the victim (Jensen & Gutek, 1982), other workers, friends and family often treat the victim as if he or she initiated or caused the harassing behaviors (H. P. Curran, personal communication, January 11, 1984; Jensen & Gutek, 1982). The victim is often socially isolated at work and at home (Curran, 1984). Furthermore, many women have found that when they do complain, they are often not taken seriously by investigators (Livingston, 1982), members of the legal profession and organizational members (Curran, 1984).

These factors lead many women to avoid work (Curran, 1979). This is manifested as high distractibility (Jensen & Gutek, 1982), decreased motivation to work (Jensen & Gutek, 1982), tardiness (Curran, 1979, Hoyman, unpublished), absenteeism (Curran, 1979, 1984; Hoyman, unpublished) and decreased productivity (e.g. Curran, 1979; Tangri et al., 1982). Tangri et al. (1982) also reported that victims found it more difficult to cooperate with other workers and had increasingly negative feelings toward work. At least one survey respondent has attempted suicide because of her harassment experience (Curran, 1979).

Over one half of those who chose to report the incident directly confronted the harasser. Forty-nine percent

contacted someone who outranked the harasser (Curran, 1979). The number of women who turn in their harassers is climbing: Out of those responding to questionnaires, only twenty-five percent of victims reported the incident in 1976 (Silverman, 1976) while forty-six percent complained in 1980 (cf. Livingston, 1982). Using the data collected by the Merit System Protection Board (1981), Livingston (1982) found that forty-six percent objected to the harasser, eleven percent reported the incident to someone superior to the harasser, while only twelve percent did nothing. Similar results were found by Powell, et al. (1981). Only three percent used grievance channels provided by the organization. The data do reveal that the more severe the harassment, the stronger the response to it (Livingston, 1982).

The price of objection is high, however. Fifty-three percent were either transferred to another job or discharged. Poor evaluations, denied promotions, or "voluntary" terminations were experienced by nearly twenty-five percent of those harassed, while ten percent were either demoted or simply not hired. Only eighteen percent reported no consequence of complaining about sexual harassment (Curran, 1979).

Livingston's (1982) analysis of the USMSPB data is somewhat more optimistic: fifty-four percent reported that their strongest response improved the situation. Positive results from assertive responses to harassment were more likely to occur when the harasser was a coworker (63%) than

when he was a supervisor (48%). Livingston (1982) noted that women were more likely to formally report harassment when the harasser was in a supervisory position. However, for those pursuing formal action against the harasser, less than half found it improved the situation, while more than thirty percent thought it "made things worse." Few victims chose to use formal grievance procedures because of ignorance about their legal rights (Livingston, 1982), length of time required to resolve the issue (Hanley, 1980), legal expenses (Livingston, 1982), and lack of support from family, friends, coworkers, and community (H. P. Curran, personal communication, January 11, 1984).

The figures reported by Curran (1979) suggest a more severe organizational response to harassment complaints than do those obtained from the USMSPB data (e.g. Tangri et al., 1982; Livingston, 1982). Curran's sample consisted primarily of nongovernment employed women, while the USMSPB data analyzed by Tangri et al. and Livingston was composed of federal workers. It may be that the federal government is more receptive to complaints of sexual harassment than organizations in the private sector.

The consequences of reported harassment are much less severe for the harasser than for the victim (Curran, 1979). Livingston's analysis (1982) of the USMSPB (1981) data revealed that action was taken against forty-four percent of the sexual harassers. Curran (1979) found that no action of consequence was taken against seventy-eight percent of the

harassers. Thirteen percent either were terminated (or threatened with termination), resigned, or were suspended. Two percent were demoted and two percent were promoted. These figures are all the more discouraging in light of Livingston's (1982) observation that formal channels are usually used only in cases involving severe cases of harassment by a superior of a person in a lower status position.

The organization is potentially another victim of sexual harassment, although hardly in the same way as the person experiencing the harassment. As stated earlier, the costs of harassment to the federal government approach $100 million annually. Decreased motivation, absenteeism, decreased productivity, and turnover all reduce organizational effectiveness (Tangri, et al., 1982). Negative public reaction is also a force with which to contend. H. P. Curran (personal communication, January 11, 1984) recounts the true story of a grocery in which the male butchers were harassing the female butchers. The women had ignored it until pictures of women, depicted as meat portions, began appearing in the shop. Fearing physical harm, the women confronted their male coworkers. The woman chastising the men had "inadvertently" turned on the paging microphone, allowing the customers to hear the exchange. A local newspaper carried the story as well. Many people were angry about the harassment and stopped shopping at the store. It was forced to close soon after.

Conclusion

This section reviewed the literature and current thinking about sexual harassment. Variables relevant to the discussion of sexual harassment were introduced. The relationships of harassment to individual, interpersonal, organizational and harasser variables were explored.

The research to date has been concerned with defining sexual harassment in terms of antecedents and consequences. Certain variables influence the likelihood and severity of harassment resulting in negative consequences. But feedback linking harassment to the status of antecedent variables or relating the consequences of social-sexual behaviors to future harassment incidents has not been considered. In the following pages, the role of feedback in various systems will be considered.

The Application of System Dynamics

System dynamics has been used to understand systems ranging from conformity (Richmond, unpublished) to technological conversion in industry (Graham & Kreutzer, 1983). At the 1983 International System Dynamics Conference, Richmond (1983) noted that although system dynamics has been a force in organizational subsystems (e.g. the market growth model by Forrester, 1968a), its real strength lies in the virtually untouched (by system dynamicists) area of industrial/organizational psychology. This section will describe the construction, behavior, and

policy implications of two system dynamics models of psychological and organizational problems (Richmond, unpublished, Frohman, Morgan, & Pugh, 1978). Similarities between these models and the model of sexual harassment developed in this paper are discussed.

Modeling the Milgram Experiments

Generalizing Individual Behavior

In modeling the Milgram experiments in compliance (Milgram, 1965), Richmond (unpublished) was faced with the problem of generalizing behavior from individual uniqueness. For example, some participants in Milgram's experiments gave "fatal shocks" to the confederate, while others refused to administer shocks. Richmond hypothesized that although the participants behaved differently, the same sets of rules were governing their behavior. Research on feedback systems has demonstrated that "common dynamic processes are produced by analogous feedback structures" (Richmond, unpublished, p. 4). In other words, comparable feedback structures can be found in such diverse processes as hunger, alcoholism, and an airplane's automatic pilot.

Richmond (unpublished) hypothesized that the same dynamics were driving the behavior of all the individuals participating in the Milgram (1965) experiments. Differences in their behavior could be explained by different parameter values assigned to the same structural mechanisms. The behavior of every individual can then be understood from the perspective of a single generic model.

Even though the underlying structures driving their behavior are the same, individuals are "uniquely parameterized" (Richmond, unpublished, p. 5) by their genetic and experiential backgrounds.

Developing a Model of the Milgram Experiments

Milgram's (1965) notes on his laboratory experiments gave Richmond (unpublished) enough information to determine causal relationships and construct a model. For example, the following passage from Milgram was used to develop the causal loop diagram in Figure 2.

> How is the occurrence of tension to be interpreted? First, it points to the presence of conflict. If a tendency to comply with authority were the only psychological force operating in the situation, all subjects would have continued to the end and there would have been no tension. Tension, it is assumed, results from the simultaneous presence of two or more incompatible response tendencies. If sympathetic concern for the victim were the exclusive force, all subjects would have calmly defied the experimenter. Instead, there were both obedient and defiant outcomes, frequently accompanied by extreme tension. A conflict develops between the deeply ingrained disposition not to harm others and the equally compelling tendency to obey others who are in authority. The subject is quickly drawn into a dilemma of a deeply dynamic character, and the presence of high tension points to the considerable strength of the antagonistic vectors. (Milgram, 1965)

The arrows in Figure 2 indicate the direction of causation. The positive or negative sign at the end of the arrow denotes the nature of the relationship. A positive relationship between two variables means that given a change in the first variable, the second variable will change in the same direction. Negatively related variables will

change in opposite directions. The sign in the center of the loop refers to the polarity of the loop. A positive loop behaves like a "vicious circle." It has also been described as a "snowball effect" due to the fact that the system grows more rapidly as it grows larger. A negative loop is usually described as self-correcting or goal-seeking (Richmond, unpublished). See the Appendix for more detail about reading causal linkages and understanding loop polarity.

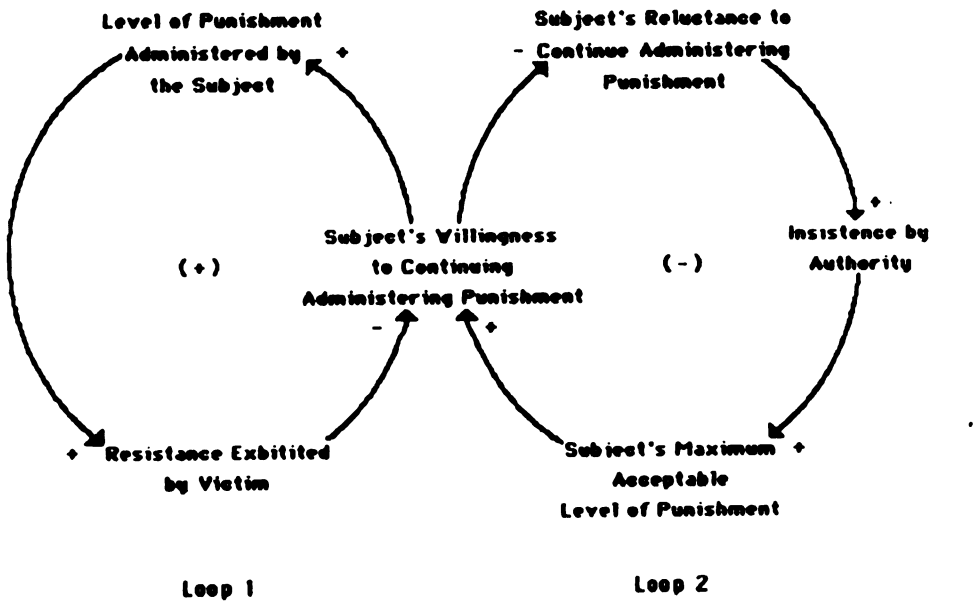

Figure 2. Milgram's "antagonistic vector" hypothesis (from Richmond, unpublished, p. 9).

Both loops in Figure 2 are negative loops. Loop 1 represents the subjects desire not to hurt the victim. The greater the resistance by the victim, the less willing the subject is to administer shocks. Loop 2 represents the authority insistence that the experiment continue. Only when the subject expresses reluctance to shock the victim

does the authority figure express insistence. These two loops work together to describe one facet of Milgram's experiments (1965).

These loops and others constructed from Milgram's descriptions of his laboratory studies were translated into flow diagrams and computer equations. Runs were conducted for the different experimental conditions as well as for different "individuals." The model was tested using many of the traditional model testing techniques to be outlined in the next chapter.

One advantage of a system dynamics model is the unlimited "sample" one can create by varying parameters to create an infinite number of "unique individuals." These same "individuals" can then be tested under different experimental conditions. Secondly, Richmond (unpublished) strongly noted that no changes in the model were necessary to explain different experimental outcomes. For the same experimental conditions, parameter-value changes alone could create all the outcomes described by Milgram. For example, the variable "sensitivity to authority directives" could be altered to reflect different sensitivities among individuals.

Finally, the use of simulation offers the opportunity to explore human behavior under conditions not ethically feasible in the laboratory. Milgram came under a great deal of criticism for what some considered to be poor treatment of subjects (e.g. Baumrind, 1964; Orne & Holland, 1968).

Computer simulation requires no physical sample and so is immune to concerns of ethical treatment of subjects.

Modeling the Introduction of Minorities into Management

With the advent of affirmative action programs in organizations it became necessary to develop an organizational system integrating the previously isolated functions of recruiting, training and development, and organizational development (Frohman, Morgan & Pugh, 1978). A manager seeking to increase the numbers of minorities at all levels of the organization must be cognizant of many factors. The size and quality of the minority applicant pool, compensation policies, prejudices of the present worker population and other variables must be considered together before an acceptable affirmative action policy can be formulated.

A systems approach permits an understanding of system behavior through its structure. For example, a major organization in the Boston area was faced with an affirmative action problem similar to that described above. Frohman, Morgan and Pugh (1978) formulated a system dynamics model to represent the organization and the variables necessary to achieve minority involvement in the organization. In this particular case, blacks were underrepresented in the skilled trades and executive and professional positions. None held seats on the board or directors. Goals for minority participation were

established for all levels of the organization.

Placement of blacks in higher-level positions could be accomplished through promotion of blacks from lower levels within the organization or recruitment from outside the organization. Exclusive use of either policy could lead to disaster, however. Using only internal promotion to accomplish goals might mean promotion of unqualified people or preferential selection for training programs. Resentment among majority members towards minorities in the organization would be expected.

Meeting affirmative action goals by hiring outside the organization can also present problems. Assuming enough qualified minorities, internal promotion policies would have to be altered. If well-qualified minorities are in short supply, they will command higher salaries than widely available majority workers. Again, resentment may pose a problem.

In the Boston organization's situation a combination of internal and external hiring policies was deemed necessary. However, determining the most effective combination of these policies to meet affirmative action goals would best be accomplished using an analytical technique capable of handling numerous variables and comparing different hiring programs.

The consultants, together with members of the organization, developed two system dynamics models of minorities in management. The conceptual model was a fairly

simple one designed to introduce those in the organization to system dynamics and the system dynamicists to the organization. The more accurate and complex second model was developed from information gleaned from development of the first model.

The task force assembled a list of variables (see Table 4) they thought would affect the success of any affirmative action policy. The interactions between these variables were then examined.

Table 4. Problem areas in the introduction of minorities into management.

Availability of blacks
Recruitment of blacks
Promotion of blacks
Training of blacks
Salary scale of blacks
Availability of housing for blacks
Sincerity of company in seeking blacks
Prejudice
White backlash
Black backlash
Sponsorship
Sensitivity training
Under-utilization of black skills
Promotion of blacks beyond their skill level

From Frohman, Morgan, & Pugh (1978), p. 552.

Prejudice sometimes prevents supervisory and coworker cooperation needed by black workers to succeed on the job. Performance suffers as a result. Worker evaluations reflect this poor performance and reinforce the negative perceptions some whites hold of minorities.

The conceptual model was constructed using causal hypotheses like those in Figure 3. This model was a useful

educational tool for the task force, but its simplicity obviated confidence in the model as a decision-making tool. The highly complex second model examined the career paths of blacks and whites from the time they joined the company until they left. This model, depicted in Figure 4, shows that as the promotion rate of blacks surpasses that of whites, whites begin leaving the organization.

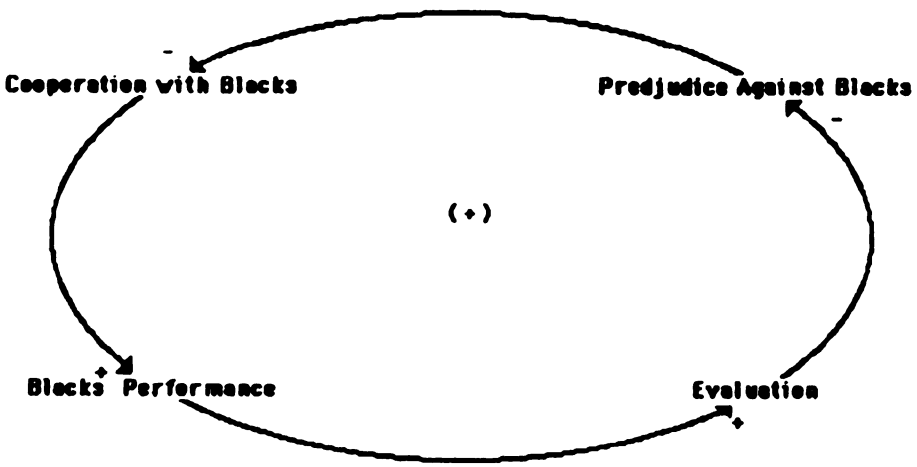

Figure 3. Prejudice towards blacks and blacks' performance. (from Frohman, Morgan, & Pugh, 1978, p. 553).

It can also be seen that blacks' motivation to perform on the job is a function of the prejudice of whites. Increased cooperation from whites made it easier for blacks to achieve their potential. Also, a slight lack of cooperation was thought to motivate blacks to work harder to prove themselves able workers. Although not visible in Figure 4, the modelers graphically depicted the relationship between prejudice and motivation. It is a simple process to translate graphs into equations for DYNAMO, the computer

simulation language used by system dynamicists (see the Appendix for a more detailed explanation). The graph of this function is depicted in Figure 5. The researchers and task force members hypothesized that a small amount of prejudice would motivate the worker to prove he or she could do the job. However, extreme levels of prejudice or cooperation would result in lowered motivation levels.

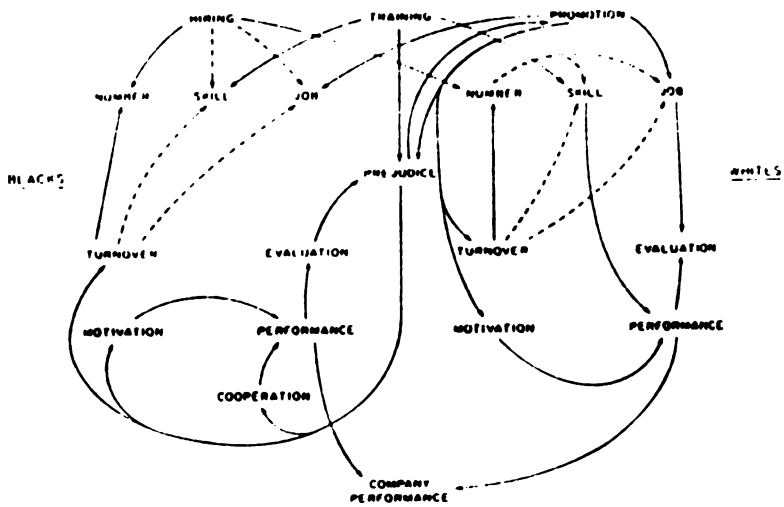

Figure 4. Introduction of minorities into management (from Frohman, Morgan, & Pugh, 1978, p. 555).

The impact of the organization on the affirmative action program can be seen at several points: number of minority and majority recruits, recruits' skill level, initial job level, and amount of training provided by the organization. Having constructed and simulated the model, the task force realized that the recruits' skill level deserved more attention. One organizational goal was that of developing equal skill levels for minority and majority group members with the same job. If blacks were to hold

positions throughout the organization and racial tensions were to be kept to a minimum, then equal skill levels would be required for blacks and whites holding the same position. Unequal skill levels for the same jobs would lead to oppression if the blacks were more highly qualified, and a white "backlash" if blacks were less qualified.

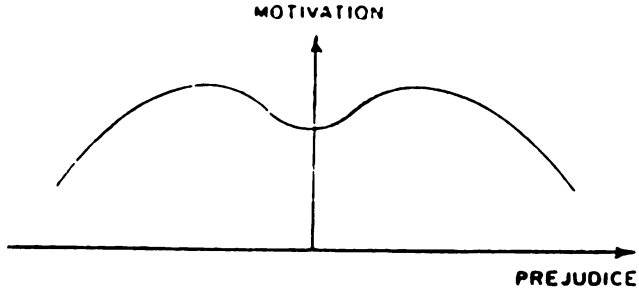

Figure 5. Relationship between prejudice and motivation (from Frohman, Morgan, & Pugh, 1978, p. 556).

In order to have minority representation at higher levels within the organization it would be necessary to either recruit very highly qualified blacks from outside the organization or to speed the promotional process for lower-level blacks within the organization. The latter requires training and development focused primarily on minority workers. However, the model in Figure 6 shows preferential training to be an important contributor to prejudicial feelings. Prejudice decreases the cooperation between whites and blacks, and turnover climbs for both races.

Equations detailing the model's structure were written, and the model was simulated on the computer. The first run simulated the condition where blacks were given highly

preferential treatment. The goals of the organization in this first simulation run were to double the number of blacks in management and to have blacks performing the same jobs as whites within five years. Figure 6 is a computer printout of this simulation run.

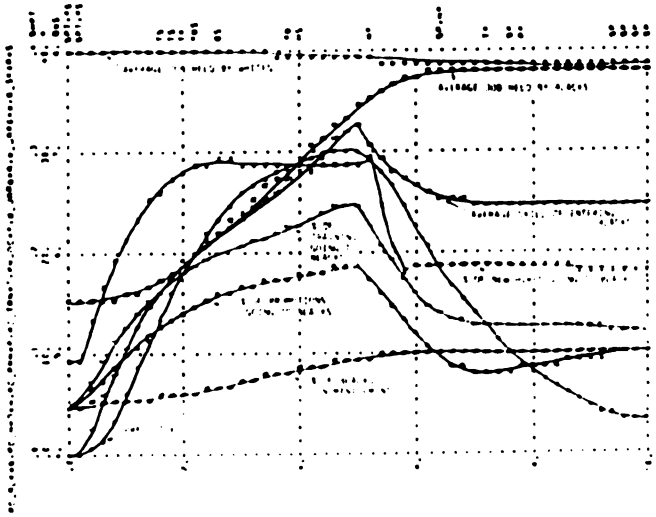

Figure 6. The effect of preferential training and promotion (from Frohman, Morgan, & Pugh, 1978, p. 557).

Blacks receive three times the training and two times the promotions of their white coworkers. As preferential treatment rises, so do prejudice and turnover. After six years, some degree of normalcy returns.

For the second run, a less preferential stance was taken (see Figure 7). Recruitment of highly qualified blacks was emphasized to reach the same goals within the same time frame as the first run above. Prejudice climbs only half as high as in the first run; turnover and productivity are also less affected. While some

preferential training and promotion may still be needed, the thrust of the most effective affirmative action policy for this organization is increased recruitment of minorities at all levels of the organization.

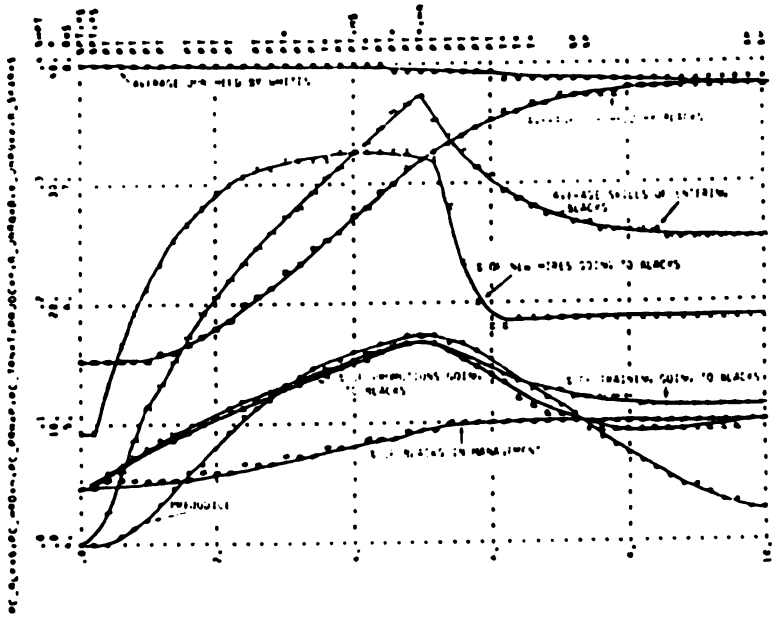

Figure 7. The effect of external recruitment of minorities (from Frohman, Morgan, & Pugh, 1978, p. 558).

Thesis Problem: A Model of Sexual Harassment

There are many similarities between the systems presented above and the problem of sexual harassment. A laboratory study of sexual harassment examining the effects of high levels of harassment on psychological health would certainly pose important ethical questions. Also, many organizations are reluctant to allow their workers to participate in a study of sexual harassment for fear of "letting the cat out of the bag" and exposing themselves to lawsuits and Department of Labor actions. A system dynamics

approach to the problem of sexual harassment avoids some of these problems and allows for a theoretical conceptualization of the problem.

The use of system dynamics to explore the mechanisms underlying sexual harassment is not an extension of system dynamics; it is merely another application. In many ways, the dynamics of harassment are similar to those of the Milgram experiment. For example, Figure 8, depicting a small portion of the sexual harassment dynamics, is similar to the prejudice dynamics Figure 3. Both depict the effect of attitudes on job performance and performance evaluation.

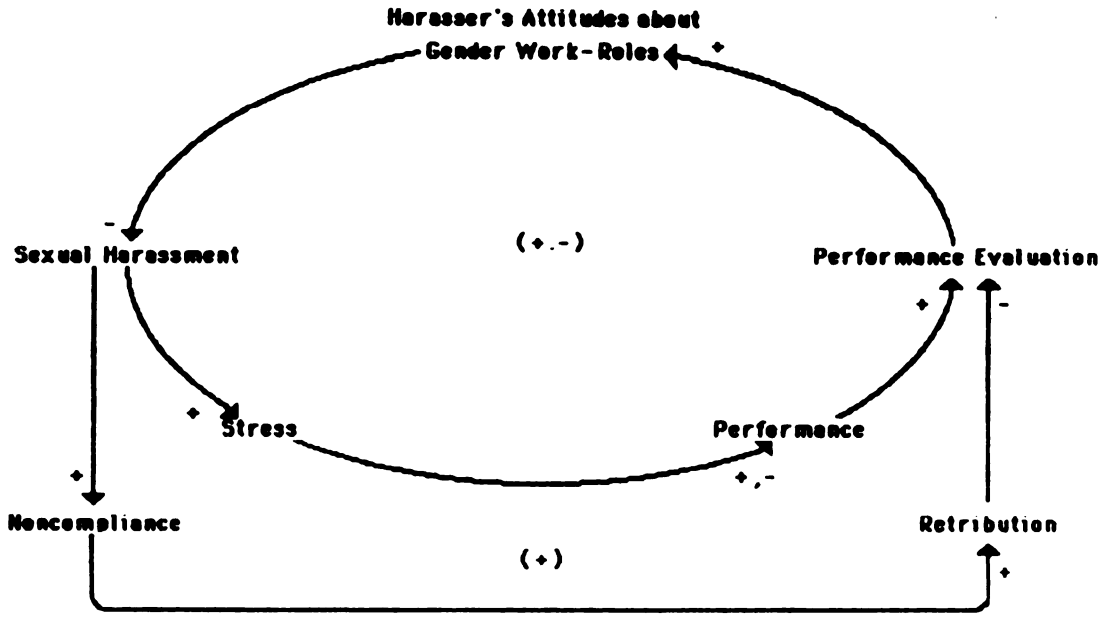

Figure 8. The effect of discrimination and harassment on performance evaluation.

While similar, harassment and discrimination are not the same thing. Harassment, as defined in this paper, is of a sexual nature, while discrimination is gender based.

Discrimination resulting from the victim's noncompliance with the harasser's demands can affect performance evaluations, reinforcing the harassers negative veiw of working women. Additionally, the stress from the harassment may cause a decrease in job performance, further eroding the organization's perceptions of the victim's job performance and of women as valued members of the workforce. More sexual harassment is likely.

Summary

This chapter defined the problem of sexual harassment in terms of its pervasiveness and costs to both the individual and society. Four popular theories of sexual harassment were discussed: the natural/biological theory, the organizational theory, the socio-cultural theory, and the spillover theory. The role of individual differences in the perception of behaviors as sexual harassment was described. The antecedents and consequences of sexual harassment were outlined. System dynamics modeling was introduced, and the appropriateness of dynamic modeling to the problem of sexual harassment was described. Two applications of dynamic modeling were discussed, and the similarities of those systems to that of sexual harassment in the organization was presented.

The methodology used to develop, evaluate, and implement a system dynamics model of sexual harassment is presented in the next chapter. The iterative problem-

oriented approach (Roberts, 1983) detailed in Figure 1 is described in detail, and its applicability to the system dynamics model of sexual harassment is presented.

III. METHODS

This chapter presents the methodology used to conceptualize, build, and test a system dynamics model of sexual harassment. It describes the research participants, the model-building process, and the tests of model structure, behavior, and policy implications. Specific tests used to analyze the representativeness of the model are presented.

Data Sources

Research participants are the Director of the Office of Women and Women and Work, Michigan Department of Labor; and the Departmental Counselor and the Director of Minority and Women's Programs, both of the Division of Human Relations at Michigan State University. Also serving as data sources are forty-seven case studies obtained from the Michigan Task Force on Sexual Harassment in the Workplace (Curran, 1979).

Building the Model

The system dynamics model of sexual harassment is developed using the iterative problem-oriented approach suggested by Mitroff (1977) and others and delineated by Roberts et al. (1983) in Figure 1. The conceptual model development stages of problem definition (Step 1) and system conceptualization (Step 2), the transitional stage of model representation (Step 3), and the technical aspects of model behavior (Step 4), evaluation (Step 5), policy

analysis and model use (Step 6), and model refinement are presented in the following pages. Actual development of the system dynamics model of sexual harassment is detailed in Chapter IV.

Step 1: Problem Definition

The problem of sexual harassment, in terms of pervasiveness and costs, was defined in previous sections. The consequences of sexual harassment and the variables associated with the incidence of harassment were also described (see Tables 2 and 3). These variables were consistently mentioned by victims (e.g. Jensen and Gutek, 1982; Curran, 1979) and by sexual harassment experts.

Subsumed under this phase of model development is a clear understanding of why a dynamic model is needed. As stated earlier, because of the pervasiveness of the problem, its far-reaching effects, and a growing intolerance of sexual harassment, it is timely topic. Secondly, the research to date has focused primarily on this first stage of system understanding. The few attempts at the second stage of system conceptualization (e.g. Brewer, 1982; Tangri et al., 1982) have paid little attention to system boundaries (i.e. the lack of research concerning the harasser and the organization). Additionally, feedback structure has, for the most part, been ignored.

The model of sexual harassment constructed in this thesis is concerned with the problems faced by the individual victim. Because most of the research has been

focused at the individual level and more information is therefore available, this thesis examines the dynamics of the harassed individual within the context of an organization.

Step 2: System Conceptualization

The second stage of the Roberts et al. (1983) approach involves the determination of system boundaries and feedback. Before boundaries can be established, clear definition of the problem and its level of aggregation is necessary. Unless a specific problem is defined, the system can be expanded indefinitely.

Variables within the boundaries of a system dynamics model can be classified as endogenous and exogenous variables. Endogenous variables are wholly defined by other variables in the system and influence other variables. Stress, self esteem, and marital status are examples of endogenous variables in the model of sexual harassment. Exogenous variables, on the other hand, affect endogenous variables, but are not themselves affected. Variables that do not influence the system, such as morals and the incidence of sexual harassment in the general population, are not included in the model. The boundary relationship between these variables is presented in Figure 9.

As Goluke, Landeen, and Meadows (1983) note, although variables are excluded from the model, this does not mean that they are totally unrelated to the system. Boundaries are chosen as a starting point, and can be changed during

the iterative model building process (see Figure 1). The variables in Figure 9 are only a representative sample of the variables that comprise the model. It is also important to note that no structural relationship between these variables can be inferred from Figure 9. Only their status as an endogenous or exogenous variable is depicted.

Since the model of sexual harassment is concerned with the individual in an organization, system boundaries can then be set around the victim, the harasser, and the organization. These three factors are all interrelated (e.g. Tangri et al., 1982, Curran, personal communication, January 11, 1984) and comprise the three sectors of the system dynamics model.

A causal loop diagram detailing the feedback underlying each of these sectors is constructed. The antecedents and consequences outlined in Tables 2 and 3 form the basis for the harassment victim sector. Feedback loops for all three sectors are drawn with the aid of the literature, case studies of forty-seven harassment victims (Curran, 1979), and other system dynamics models (e.g. Goluke et al.'s, 1978, model of alcoholism; Levine, Van Sell, and Rubin's, unpublished model of burnout; Frohman et al.'s (1978) model of minorities in management).

For example, Goluke et al.'s (1978) model of alcoholism examines stress in great detail. Much of that analysis is transferable to the problem of sexual harassment. As stated earlier, the analogous nature of

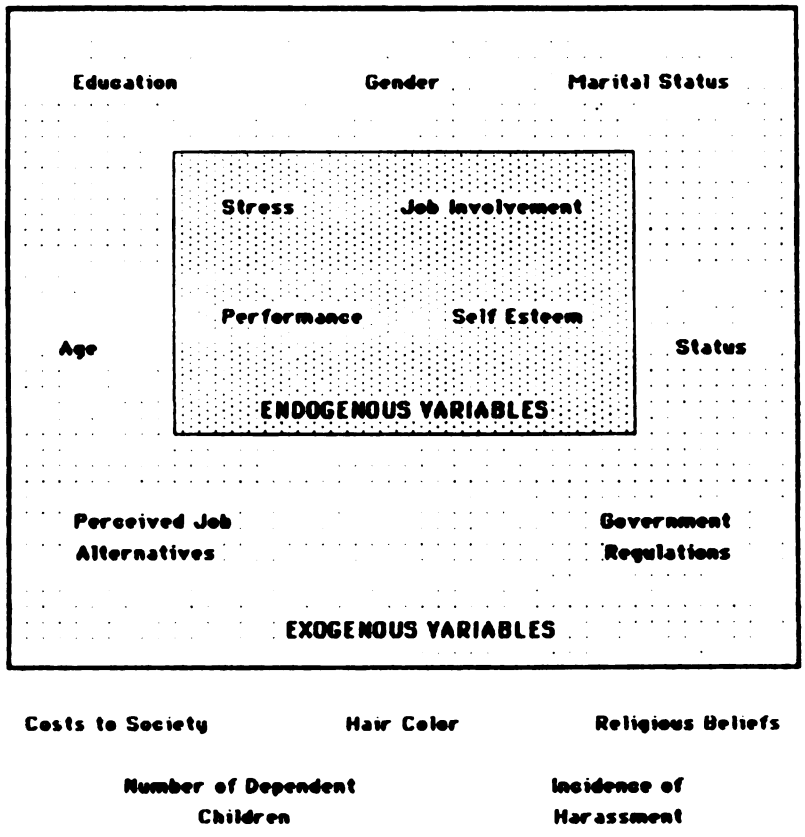

Figure 9. Sample variables included in the model of sexual harassment (adapted from Goluke et al., 1983, p. 626).

feedback mechanisms make possible the use of the stress sector from their model.

Information about system feedback is also be obtained through interviews with three sexual harassment experts. They are asked the question posed by Richardson and Pugh (1981, p. 63): "If A affects B, how does B affect A?" They are also asked about the role that time plays in these interactions and the severity of effects of harassment. Further, they are questioned about the addition or deletion of variables from the model, and how those variables might interact with others. The effect of harassment on job involvement was added to the model as a result of one of these interviews.

Hypothesized variable linkages are obtained from interviews with harassment experts, reviews of victim case studies, and work done by other modelers (e.g. Levine, Van Sell, & Rubin, unpublished). For example, Silverman (1976) found that harassment causes many women to be fearful and intimidated. This reduces their ability to confront the harasser, one coping skill H. P. Curran (personal communication, January 11, 1984) found to be effective in dealing with harassers.

Once all the loops of the victim, harasser, and organization sectors are completed, they are translated into DYNAMO rate/level diagrams. While causal loop diagrams are better at communicating relationships to those unfamiliar with system dynamics, they are less clear about

the nature of the variables and the mechanisms that drive their behavior (see the Appendix for a detailed description of DYNAMO rate/level diagrams and their constituent elements).

Step 3: Model Representation

The model must be written in language the computer can understand if it is to be simulated. The translation to DYNAMO equations from DYNAMO rate/level diagrams is a fairly simple task. The variables in rate/level diagrams typically fall into one of four categories: rates, levels, auxiliaries, and constants. DYNAMO has specific forms of equations for each of the four variable types. These equations are presented in Appendix B.

Step 4: Model Behavior

In this fourth stage of model development, the behavior of the model variables over time are examined. The DYNAMO equations are entered into the computer, and the model is simulated. Various time lengths and "uniquely parameterized" victims, harassers and organizations are simulated.

Step 5: Model Evaluation

As in traditional psychometrics, model validity is dependent upon the purpose for which it is to be used. Lewis Carroll (cf. Richardson and Pugh, 1981) provided an apt analogy when he observed that a broken clock is more accurate than one that loses one minute every day. The former displays the correct time twice daily; the latter

approximately every two years. The desired purpose of the clock determines which of the two displays is more valid. If one is more concerned with being on time for appointments, the slow watch has a more valid display.

And so it is with system dynamics models. Although a model may never match point-for-point actual system behavior, it may very accurately forecast behavioral trends over time. The evaluation (or application) of a model is limited to the purpose for which it was designed. Unlike some traditional one-time evaluation techniques, system dynamics model validation is continuous throughout the iterative process of model construction.

Many system dynamicists eschew the term validation to describe the evaluation of a model. Instead, suitability (Richardson & Pugh, 1981) and confidence building (Forrester & Senge, 1980) are used. A clearly defined goal for the model helps to minimize the subjectivity associated with these terms.

Richardson and Pugh (1981) maintain that a model should be judged by its utility and effectiveness. These criteria go beyond suitability and consistency to include a model's ability to communicate to its audience, enhance understanding of the problem, and generate insights to solve it. The evaluation of model utility and effectiveness is determined through a series of fairly objective tests (Forrester & Senge, 1980), which together

> form a formidable filter, capable of trapping and weeding out weaker models and allowing passage only to those most likely to reflect something close to truth. (Richardson & Pugh, 1981, p. 313)

Although no one of these tests is enough to ensure confidence in a model, with each successful passing of different tests the model gains credibility.

Testing, to a system dynamicist, means comparing the model-generated behavior to empirical reality. Empirical, that is, in the sense of deriving from experience or experiment. Interestingly, both experience and experiment are derivations of the same French word, experiri. This definition allows the inclusion of a great many data sources besides numerical statistics.

Forrester and Senge (1980) have compiled a series of seventeen confidence building tests. Model validity, they maintain, is dependent on modeler and client confidence that the model is sound and useful as a policy tool. They believe confidence, rather than validity, to be the proper criterion because of the common belief that validity connotes truth. There is no method to prove a model is absolutely true. They observe that Einstein's theory of relativity has not been proven true, but it will be a useful model until it has been disproven. Similarly, system dynamicists test a model against a wide variety of structural and behavioral tests, gaining confidence in their model as each successive test is passed. Various confidence building tests, adapted from Forrester and Senge (1980), are discussed below.

Tests of Model Structure

The structure-verification tests compare the structure of the model with the actual system. This includes review of basic assumptions by experts and comparison of the model to relevant literature. The structure-verification test is usually conducted first by the modeler based on his or her knowledge about the system, and then by those having direct contact with the problem.

Parameter verification is conducted in much the same way as the structure-verification test above. For example, the percentage of women who quit their jobs as a result of sexual harassment is quickly found by consulting the literature. Both parameter-verification and structure-verification tests seek to define system decision-making processes. System structures determine the material and information flows, while parameters define the pressures these forces exact on the system.

Extreme conditions can be inserted into the model to test model structure. For example, if the number of customers at a supermarket falls to zero, one would expect profits to plummet; if groundwater contamination climbs high enough, related health problems should also appear. Similarly, if sexual harassment were set at the maximum level imaginable, stress should skyrocket, and turnover would be imminent. If a model does not meet this test there may be serious structural problems. Even though such

extreme conditions may never occur, the model should be capable of charting their impact.

In the course of the extreme-conditions test, each rate equation is traced back to the state variables on which it depends. Extreme values are then inserted for each of these levels to determine the tenability of the rate formulation. Tests of extreme conditions often reveal flaws in model structure. They also allow insight into the use of policies that force a system to function outside its normal operating range. The extreme-conditions test is a robust test requiring an investment of time, but little system dynamics skill.

The structural boundary-adequacy test evaluates the appropriateness of boundary placement and model aggregation. A clear model purpose is necessary before the adequacy of the established boundaries can be determined. Also, it is important that the model purpose be clearly specified to avoid unlimited extension of the model's scope.

Another check of model structure is scale consistency. By examining the rate equations for metric consistency, the dimensional-consistency test can expose unsound model structure. This test also checks formulations for contrived mathematical conveniences. Model structure should not be formulated without some relevance or counterpart in the actual system.

Lastly, traditional statistical tests are sometimes used to evaluate the structural integrity of system dynamics

models, although not without controversy. Using model-generated data, Mass and Senge (1978) found that some of the causal mechanisms necessary to explain model behavior were not statistically significant. For this reason, Forrester and Senge (1980) do not consider tests of significance sufficient grounds for rejecting dynamic hypotheses about model structure. When supported by other tests outlined in this section, statistical tests may reveal possible flaws in the model structure. By themselves, they lack sufficient power to determine the significance of causal hypotheses (Forrester & Senge, 1980).

Tests of Model Behavior

The behavior of the model may be examined to determine the suitability of the model structure. The behavior tests include behavior reproduction, behavior prediction, behavior anomaly, family membership, surprise behavior, extreme policy, boundary adequacy (behavior), and behavior sensitivity. Each of these tests of model generated behavior are discussed in next few pages.

The various subtests comprising behavior-reproduction tests compare behavior generated by the model with actual system behavior. They include tests of: symptom-generation, frequency-generation, relative-phasing, multiple modes, and behavior characteristics. The symptom-generation test assesses the model's ability to recreate the the system's problem. If the model cannot reproduce the problem, it is unlikely to suggest policies that can solve it. The model's

behavior is compared to that reported in previous research and victim case studies as described in the Michigan Department of Labor, Office of Women and Work Hearings (Curran, 1979).

As their names suggest, the frequency-generation and relative-phasing tests examine the nature of the relationships between variables. The first examines how well the model can match cyclic frequencies such as those commonly seen in marketing or economic systems; the second compares the relative timing of different variables. For example, there might be a two-year delay between the time toxic waste becomes a problem and people begin to notice it. Further, it might be several more years before a government cleanup begins. Similarly, Curran (personal communication, January 11, 1984) noted that women often quit about two weeks after they realize they are being harassed. A model passing the relative-phasing test would replicate these time delays.

Multiple-mode tests analyze the ability of a model to produce multiple modes of observed behavior. Many systems display different modes of behavior. For example, a model of gross national product would be expected to represent both growth and decline.

Lastly, the behavior-characteristic test is another test of behavior reproduction. A model might be expect to explain unusual time series fluctuations or peculiar events. Predicting the date of these fluctuations is not necessary,

but establishing the antecedents to the event is. Random surges of input into the model are useful. For those systems characterized by supressed oscillations, random surges of input into the model can simulate random input into the actual system. An oil crisis or the outbreak of war could be depicted this way. Again, the model should be able to withstand these pressures.

The second category of model behavior tests is composed of behavior-prediction tests, akin to behavior-reproduction tests. While system dynamics models do not attempt point-for-point prediction, they should be able to forecast general trends of behavior and events. The pattern-prediction test assesses the model's ability to correctly predict qualitative trends such as periodicity and phase relationships. The event-prediction test is analogous to the the behavior-characteristic tests.

The behavior-anomaly test is the third test of model behavior. Model-generated behaviors that contradict system behavior usually connote flaws in the model assumptions. Aside from its popular use in model development, the behavior-anomaly test can be quite useful in confidence building. Model assumptions can be justified by demonstrating the anomalous behavior resulting from the omission of a particular aspect of the model.

System dynamics models are usually generalizable within a family of systems. The family-member test is conducted by applying the general theory of the model to another member

of the same system family. With parameter and initial level value changes, a model of national population growth could be expected to apply to India, England, or Peru. There are many similarities between sexual harassment and other systems such as burnout, alcoholism, and the introduction of minorities in management. For example, the person administering the shock in the Milgram (1965) experiment is in may ways like the harasser in an organization that condones or encourages sexual harassment. Both the shock administrator and the harasser are conforming to behavioral expectations.

The surprise-behavior test is the fifth test of model behavior. In well developed models, unexpected behavior is sometimes generated. Assuming no error in the model's assumptions, the modeler looks to the model for the causes and then to the actual system for confirmation. Often the system displayed the surprise behavior, but it went unnoticed. Surprise behavior generated by the model and corroborated by the real system increases confidence placed in the model.

With the extreme-policy test, extreme values are substituted in the policy (i.e. rate) formulations, and the effect on model behavior is observed. Knowledge of model behavior under extreme conditions usually results in improved performance under normal conditions. Even though the extreme rates used in this test may never have been encountered, it is often possible to know how the system

would respond to them. Even though crime rates have never been equal to zero, the effect of no crime on the number of people going to prison is obvious.

The boundary-adequacy (behavior) test is an extension of the boundary-adequacy (structure) test described above. Basically, this test determines whether the model includes the structure necessary to fulfill its purpose. The impact of additional structures added to the model is observed. If the boundaries have been satisfactorily established, the new variables will have little effect on system behavior.

Behavioral sensitivity to changes in parameter values may indicate flaws in the model. In the behavior-sensitivity test the model is simulated with different parameter values. Supported by other tests of model behavior, sensitivity to a few parameters does not preclude model "validity." If the sensitivity to a parameter is present in different members of the same class of systems, it probably exists in the real system. Genuinely sensitive parameters are potential inputs for policy analysis.

Tests of Policy Implications

System dynamicists generally model particular systems to gain a better understanding of a problem. Armed with this understanding, decision-makers are in a better position to formulate policies. Tests of model structure, behavior, and now policy implications are used to increase the confidence of modeler and clients that the system has been adequately represented. But unless the understanding

obtained by model formulation makes change possible, confidence in structure and behavior have no relevance. Confidence in policy implications is built through a series of four tests comparing the model's response to policy change to that of the actual system.

The system-improvement test notes whether a policy leading to improved model performance would have a similar effect on the actual system. Although this test might appear to offer the greatest potential for validity testing, there are several problems. This particular test is rarely used until sufficient confidence in the model has been developed. Also, because of the complexity of the environment in which organizations function, attribution of favorable results may be difficult. Lastly, because of long delays inherent in social systems, months or years may be required to gather sufficient information to conduct a system-improvement test. Other policy-implication tests will have to suffice in the absence of this data.

The changed-behavior prediction test considers the model's ability to predict the behavior of the system given a policy change. One way to test a model is to change a policy and evaluate the model reaction. Alternatively, a historical approach can be followed. For example, one might ask what effects an organizational harassment policy change or assertiveness training would have on the women who participated in the Michigan Department of Labor hearings (Curran, 1979). These retroactive predictions can then be

compared to the actual behavior of the system.

Once again, the boundary adequacy of the model can be evaluated, this time from the perspective of policy implications. Additional structures are hypothesized and policy implications of the old and new models are analyzed. If different implications arise because of the larger boundary then the model may be flawed. Of course, the model purpose must remain unchanged in the new model conceptualization.

Finally, the policy sensitivity of the model must be considered. If various parameter values do not affect model behavior, there is an increased likelihood that policy changes will similarly affect both the model and the real system. When parameter values differentially affect model behavior, the risk of policy implementation is higher. The model should be driven by its structure, and not the parameters assigned to it.

Table 5 summarizes the confidence building techniques outlined by Forrester & Senge (1981). These tests evaluate model structure, behavior, and policy implications. Not all of these tests are appropriate for evaluating suitability and effectiveness of all models. There are, however, several tests which are generally applicable to most models.

Tests of extreme conditions are useful for revealing flawed dynamic hypotheses. Because model behavior is primarily a function of model structure, the structure tests are particularly useful. The behavior-reproduction,

Table 5. Confidence-building tests

Tests of Model Structure

1. Structure Verification
2. Parameter Verification
3. Extreme Conditions
4. Boundary Adequacy
5. Dimensional Consistency

Tests of Model Behavior

1. Behavior Reproduction (symptom generation, frequency generation, relative phasing, multiple modes, behavior characteristic)
2. Behavior Prediction (pattern prediction, event prediction, shifting-mode prediction)
3. Behavior Anomaly
4. Family Member
5. Surprise Behavior
6. Extreme Policy
7. Boundary Adequacy
8. Behavior Sensitivity

Tests of Policy Implications

1. System Improvement
2. Changed-Behavior Prediction
3. Boundary Adequacy
4. Policy Sensitivity

From Forrester and Senge (1981) p. 227

behavior-sensitivity, and behavior-anomaly tests are commonly used among system dynamicists. The risks associated with acceptance of policies is considered using the changed-behavior-prediction and policy-sensitivity tests. These tests, with the addition of the family-member test, are used to evaluate the model of sexual harassment.

Forrester and Senge (1980) summarize by observing that the relative simplicity of system dynamics model testing is necessary in the confidence building process. Richardson and Pugh (1981) add that to further enhance model confidence, the model structure should be appropriate for the intended audience. Although the extent to which the model represents the real system may not be improved, the audience's confidence in the model might. Because system dynamics is primarily a problem-solving tool, confidence in the representativeness of the model is necessary before organization members will risk policy change. Without confidence that the actual system is represented, a model serves no useful purpose.

Step 6: Policy Analysis and Model Use

Having developed confidence in the model's behavior, the modelers are able to simulate the implementation of various policies. In the model of sexual harassment, for example, the implementation of training programs designed to reduce the the incidence of harassment could be tested. Programs that would increase the victim's available coping skills could also be simulated and evaluated. The utility

of alternative policies can be compared, permitting the selection of the policy most closely satisfying organizational goals.

Model Refinement

Although these model development stages have been presented in an orderly fashion, in reality they are not that sequential. Model building is an iterative process. As more information is obtained about the system, the problem may be redefined and reconceptualized. For example, a manager requests a consultant's services, complaining that his or her employees are poor workers. While the analysis might begin with variables such as morale and self esteem, it might later become clear that the problem is related to lack of proper tools to perform the job. The problem would then be redefined. Previously unconsidered sectors might need to be added to the model, while others thought to be important might prove to be less so.

In another example, Levine et al. (unpublished) hypothesized that exhaustion plays an important role in burnout of service industry workers. Once the model was simulated, however, exhaustion was found to play a minimal role in the dynamics of burnout. Simulated individuals do not seem to recuperate after long vacation periods. Obviously, other factors were at work. At this point, the researchers had to return to an earlier and more conceptual phase of model development and rethink the dynamics of burnout.

The refinement of system dynamics models is a continuous process. Even after a model is thought to be complete, revisions might later be needed as people or their environment change. The model of sexual harassment has been similarly refined.

Summary

This chapter detailed the iterative problem-oriented research process depicted in Figure 1. The six model building stages of problem definition, system conceptualization, model representation, model behavior, model evaluation, and policy analysis and use were detailed. The importance of continual refinement was also described. The application of these six phases of model building to the problem of sexual harassment in the organization is presented in Chapter IV.

IV. A Dynamic Model of Sexual Harassment

A system dynamics model of sexual harassment is presented in this chapter. The six steps of the iterative problem-oriented methodology (Roberts et al., 1983) discussed in the previous chapter is used to develop and test the model. Chapters I and II defined the problem with respect to the pervasiveness and consequences of sexual harassment (Step 1). The methods of a dynamic analysis of the problem were proposed in Chapter III. This chapter describes the stages of system conceptualization, model representation, behavior, evaluation, and use as applied to the dynamic model of sexual harassment.

Step 2. System Conceptualization

Sexual harassment is hypothesized to be a function of victim, harasser, and organizational variables. Central to the model are two characteristics of the victim, his or her use of coping skills to stop most harassment before it becomes serious, and the ability to activate other means to reduce harassment. The effects of the harasser's anger, perception of threat, retribution, and attitudes about gender work roles on sexually harassing behavior are explored. Finally, organizational variables including sexual harassment tradition, harassment tolerance, and response to harassment complaints are considered.

The boundaries defining the sexual harassment model have been established around the victim, harasser, and

organization. Variables comprising these sectors are presented in Table 6 and discussed in greater detail below. Because the model is developed as an integration and expansion of previous research, the level of detail is greater in the victim sector than in the harasser and organization sectors. The lack of empirical information and the difficulty in obtaining data necessitates a more speculative approach in these latter sectors. Each sector and its feedback relationships with the others is described separately. Causal loop diagrams are used to illustrate the system; the more accurate DYNAMO flow diagrams are also presented for readers interested in a more technical representation.

The Victim

Stress

Stress is hypothesized to result from a discrepancy between the actual level of stimulation and the normal level of stimulation to which one is accustomed (see Figure 10). Stimulation, as defined in the model, is the averaged flow of stimulation. It is disaggregated into reference stimulation, sexual harassment, and special stress (see Figure 11). The reference stimulation, considered as a constant, consists of the usual stressors one encounters in life. Sexual harassment, the focus of this model, is considered separately. Special stresses are those not encountered on a daily basis. Marital discord, holiday preparations, or death of a spouse are examples of special

Table 6. Sectors of a dynamic model of sexual harassment.

Victim

stimulation and stimulation norm
stress
self esteem
social credit
coping skills
compliance with harasser
job performance
job performance relative to coworkers
awareness of grievance avenues
social support
fear of retribution
vulnerability to sexual harassment
field dependence

Harasser

insight into victim's attitudes about harassment
anger
retribution
social credit
sexual harassment
fear of punishment
attitudes about gender work roles
opportunity for harassment

Organization

tolerance of sexual harassment
response to sexual harassment
establishment of harassment training programs
punishment of sexual harassers
harassment tradition
legal climate
response tradition to past harassment grievances
response to victim who complains of harassment
perceptions of victim's job performance

Stimulation, stress, self esteem, social credit, and coping skills are adapted from Goluke, U. A comprehensive theory of the pathogenesis of alcoholism. Resource Policy Center, Thayer School of Engineering, Dartmouth College. June 1980.

Social support, field dependence, work role attitudes, harassment opportunity, harassment tradition, and legal climate are exogenous variables. That is, they affect system behavior, but are not themselves affected.

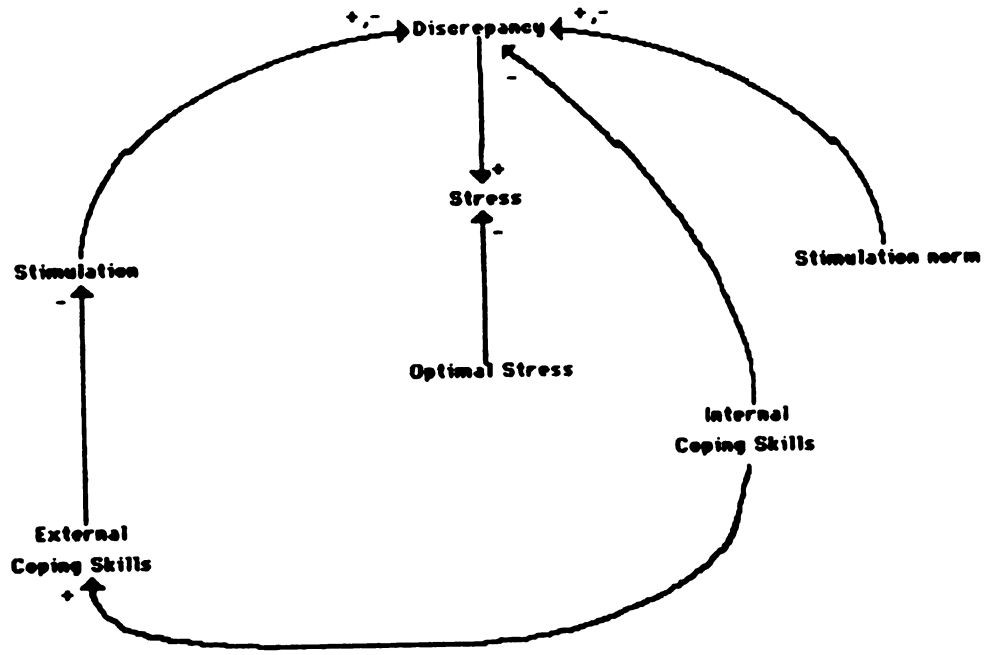

Figure 10. Causal loop diagram of victim's stress (from Goluke, 1980, p. 12).

stresses (see Holmes & Rahe, 1967). These can be inserted into the model to show the effects of sexual harassment on an individual already under much stress.

In order to reduce stress, coping skills are used to adjust the level of stimulation and/or the normal level of stimulation to which the individual is accustomed. As an extreme example, a dogmatic individual is likely to adjust the stimulation, and external source, rather than the norm, an internal source. Very gullible people would be quick to reduce the stress by adjusting their stimulation norm. Most people fall somewhere in between these extremes and can adjust both the stimulation and norm.

The level of stimulation may be lowered by several

mechanisms (see Figure 11). The stimulation may simply be ignored and allowed to leak out through the stimulation leakage rate. That is, given enough time, some things solve themselves. Alternatively, the perception of stimulation may be blocked via the stimulation adjustment rate. This internal method of stimulation reduction can be accomplished by behaviors such as drinking, psychological mechanisms such as selective attention, and other activities (e.g. the rocking behaviors displayed by autistic children and disaster survivors). These techniques act to restrict the flow of stimulation. Finally, one can actively seek to reduce the inflow of stimulation by reducing or removing from the environment the stimulation source itself.

The stimulation norm may be gradually changed through a change in stimulation as one becomes used to a new amount of stimulation. Alternatively, a more rapid adjustment can be made through the use of coping skills. The stimulation norm is based on the individual's stimulation level, the internal coping skills, and dogmatism. When confronted with a discrepancy between stimulation and its norm, the individual attempts to close the gap. The individual's dominant coping mode (e.g. stimulation adjustment) will determine how he or she first tries to reduce the discrepancy. If unsuccessful, the nondominant coping mode will also be used.

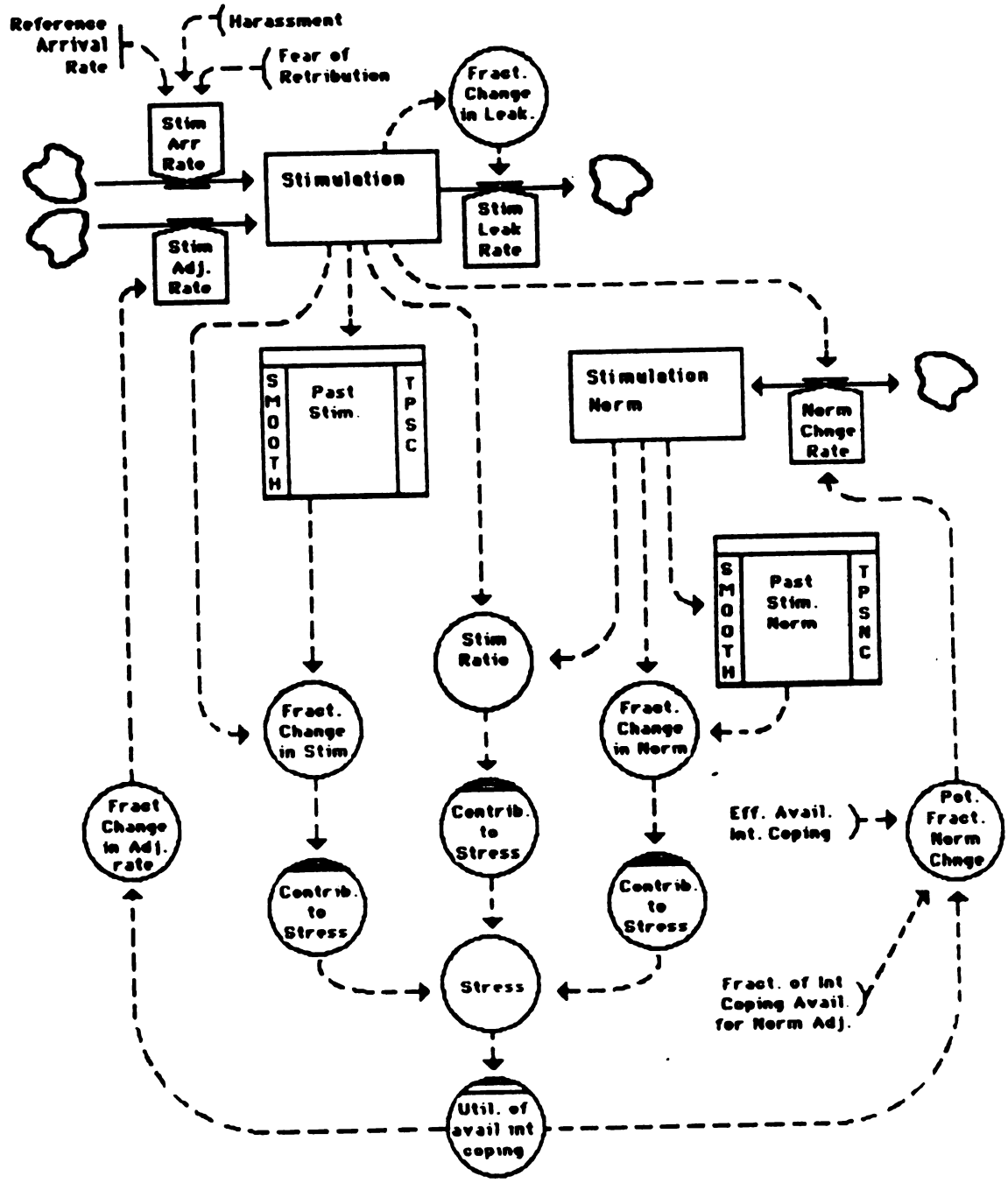

Figure 11. DYNAMO rate/level flow diagram of victim's stress (from Goluke, 1980, p. 11).

A discrepancy between stimulation and the norm is not the only source of stress. The speed at which the discrepancy is reduced is also hypothesized to increase stress. That is, change is a source of stress. The mechanisms underlying the contribution the rate of change of stimulation to stress are depicted in Figure 12. The contribution of the stimulation norm change to stress is similarly modeled.

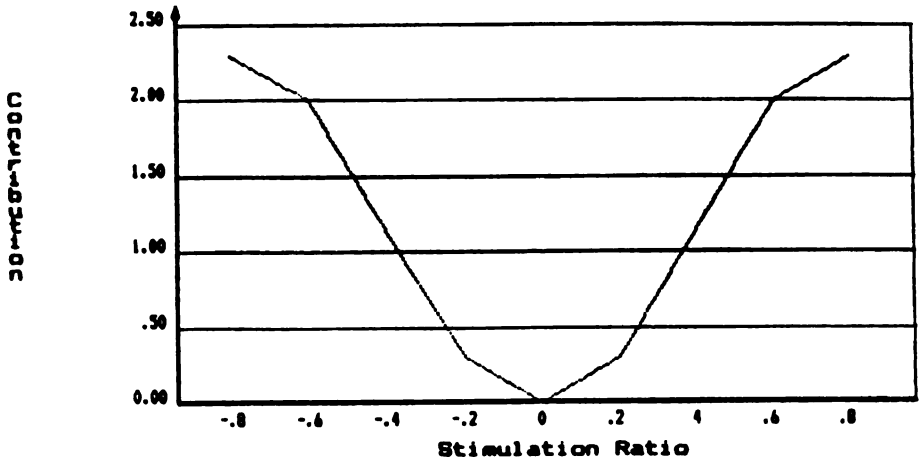

Figure 12. The contribution of stimulation change to stress (from Goluke, 1980, p. 106).

To summarize, stress is a function of the discrepancy between stimulation and its norm. In the model, stress is introduced by sexual harassment, a reference value of stimulation inflow, extraordinary circumstances, and fear of harasser retribution. Coping skills are used to reduce stress by: adjusting the level of stimulation, adjusting the stimulation norm, or reducing the source of stimulation.

Self Esteem

Self esteem develops by successfully coping with stress (Goluke, 1980). Successful coping implies a reduction in the discrepancy between stimulation and its norm. The role of self esteem in the model lies primarily in its effect on optimal stress. Optimal stress is the amount of stress at which the individual can function best. High levels of self esteem are hypothesized to increase the individual's optimal stress (see Figure 13). In short, the individual is able to handle more stress before it becomes debilitating.

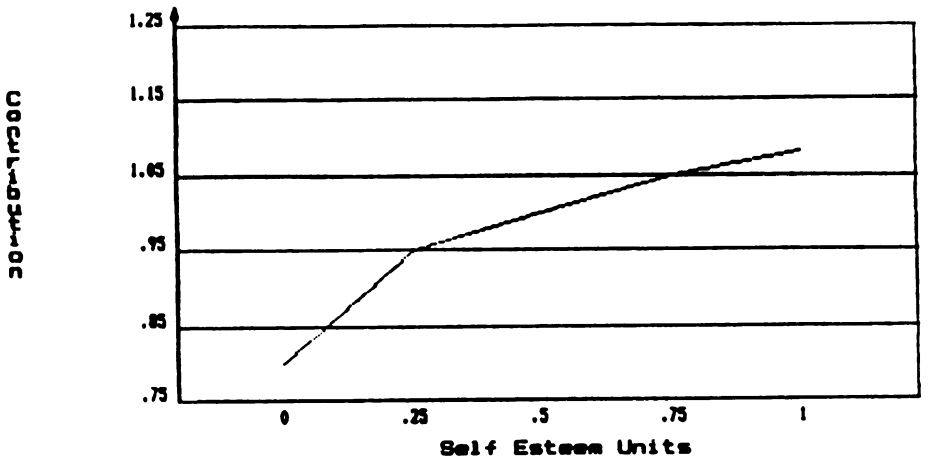

Figure 13. The effect of self esteem on optimal stress (from Goluke, 1980, p. 104).

As the victim's amount of stress approaches the optimal stress value, coping skills develop faster and degenerate slower (Goluke, 1980), job performance improves (Vance, 1949), and social credit increases (Goluke, 1980). Armed with these newly acquired resources, the individual is prepared for increasingly difficult challenges and seeks them out. These dynamics constitute a positive loop. All

things being equal, a person with high self esteem can expect unrestrained growth in self esteem. The less fortunate individual with very low self esteem can only expect further esteem decreases.

Of course, this positive loop cannot exist without some regulatory loop to constrain it. The effect of the stress/optimal stress ratio on the growth of self esteem regulates the self esteem dynamics. This ratio, like others throughout the model, acts to anchor the variable to a reference point. Self esteem not only affects the ratio between stress and optimal stress, but is also affected by it. Self esteem can be expected to grow faster as the stress ratio approaches zero. As stress increases to equal optimal stress, self esteem growth slows to zero. At stress ratio values greater than one, self esteem begins to degenerate. The relationship between the stress ratio and changes in self esteem is expressed in Figure 14.

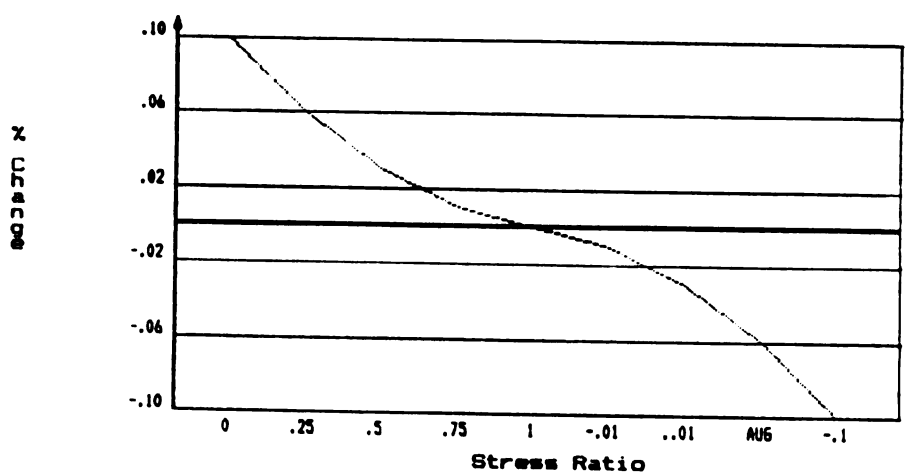

Figure 14. The theoretical effect of the stress ratio on changes in self esteem (from Goluke, 1980).

Because people take their cues from the external and internal environments, self esteem can be conceptualized as consisting of external and internal self esteem (Goluke, 1980). To the degree the individual attends to external or internal cues is determined by his or her field dependence.

High field dependence implies the individual receives most of his or her cues from the external environment. Because the external environment is hypothesized to be subject to greater variability, self esteem growth and degradation are slowed or quickened by an amplification factor. This multiplier is small for the person attending to internal cues, implying fairly stable self esteem. For the highly field dependent individual, the amplification factor becomes more important (Goluke, 1980), and makes the individual's self esteem more vulnerable to stressors in the environment. The causal loop and DYNAMO flow diagram detailing the self esteem dynamics are presented in Figures 15 and 16.

In summary, self esteem levels are highest when the individual is not subject to stress. Small amounts of stress will slow self esteem growth, while large amounts of stress will cause decay. Sexual harassment is also proposed as a negative influence on self esteem. The speed at which the self esteem level changes is a function of the victim's field dependence. Its effect on the victim's optimal stress is hypothesized to be its major influence on the system.

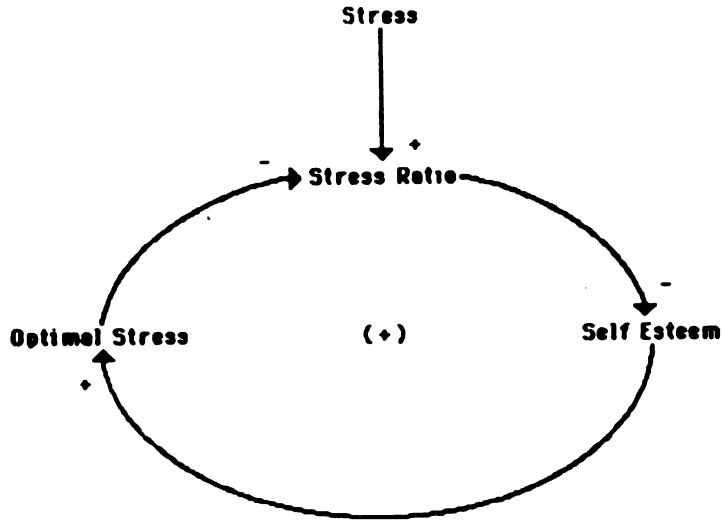

Figure 15. Causal loop diagram of self esteem (adapted from Goluke, 1980).

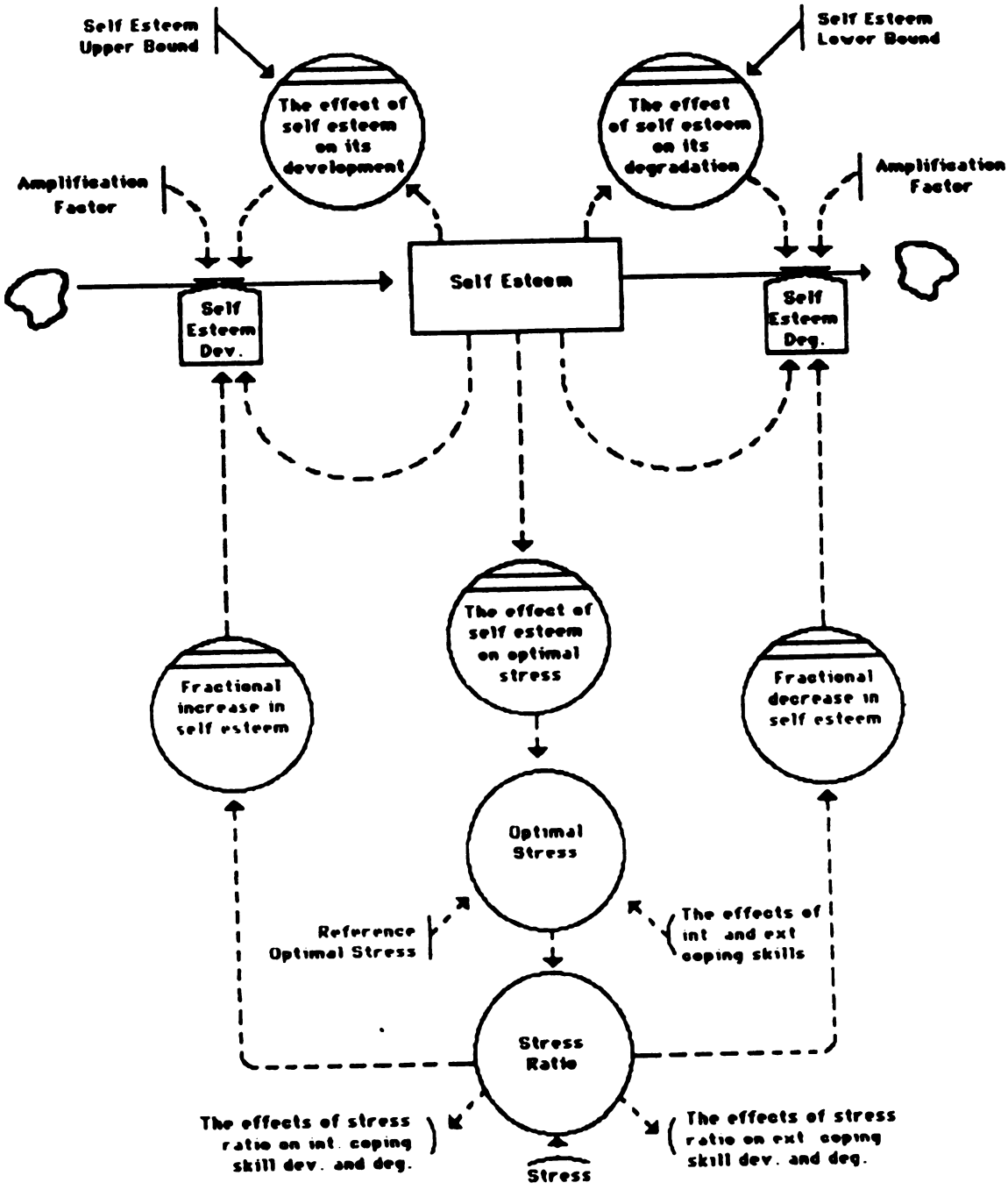

Figure 16. Self esteem rate/level flow diagram (adapted from Goluke, 1980).

Coping Skills

Coping skills are used to reduce the stress resulting from a discrepancy between stimulation and its norm (Goluke, 1980). Allocated between internal and external skills, coping skills are modeled as state variables. The notion of psychological variables as allocated resources is not new (see Navon, 1984). The causal loop and DYNAMO flow diagrams of coping skills are presented in Figures 17 and 18. Internal coping skills are used to reduce the discrepancy by adjusting the stimulation and/or the stimulation norm. Daydreaming is an obvious internal coping skill, but drinking or drug use can serve the same function: the perception of stimulation is blocked. While coping skills falling in this category may be behavioral, their function is cognitive.

For the temporarily overstimulated person, restricting the inflow of stimulation will be sufficient to close the stimulation/norm gap. However, for the individual under continual high stress this coping technique will prove disastrous. High levels of daydreaming may prompt a response from employers, adding to the already high levels of stress. The effects of long term drinking are well documented (see Goluke et al., 1983).

Internal coping skills are also used to adjust the stimulation norm. This usually occurs after attempts to reduce the perceived stimulation have failed. Of course, this is moderated by the individuals dogmatism and

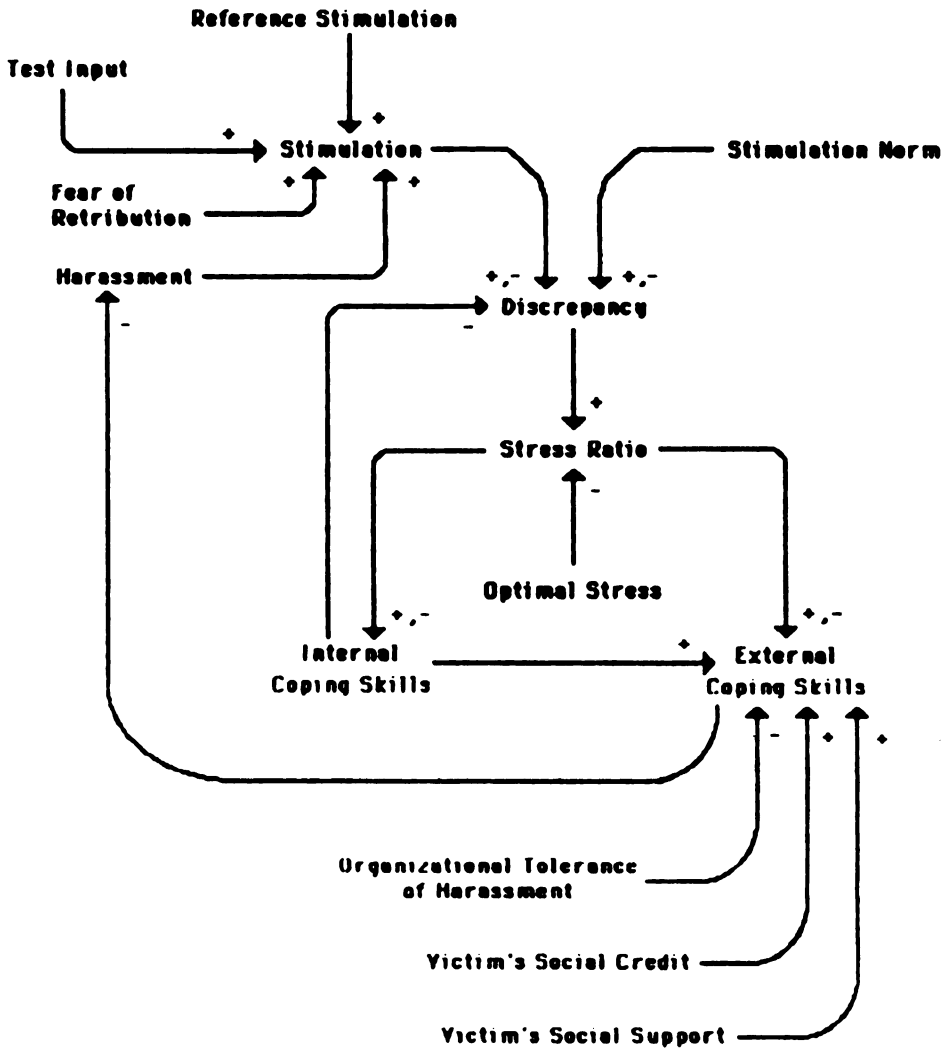

Figure 17. Coping skills causal loop diagram (adapted from Goluke, 1980).

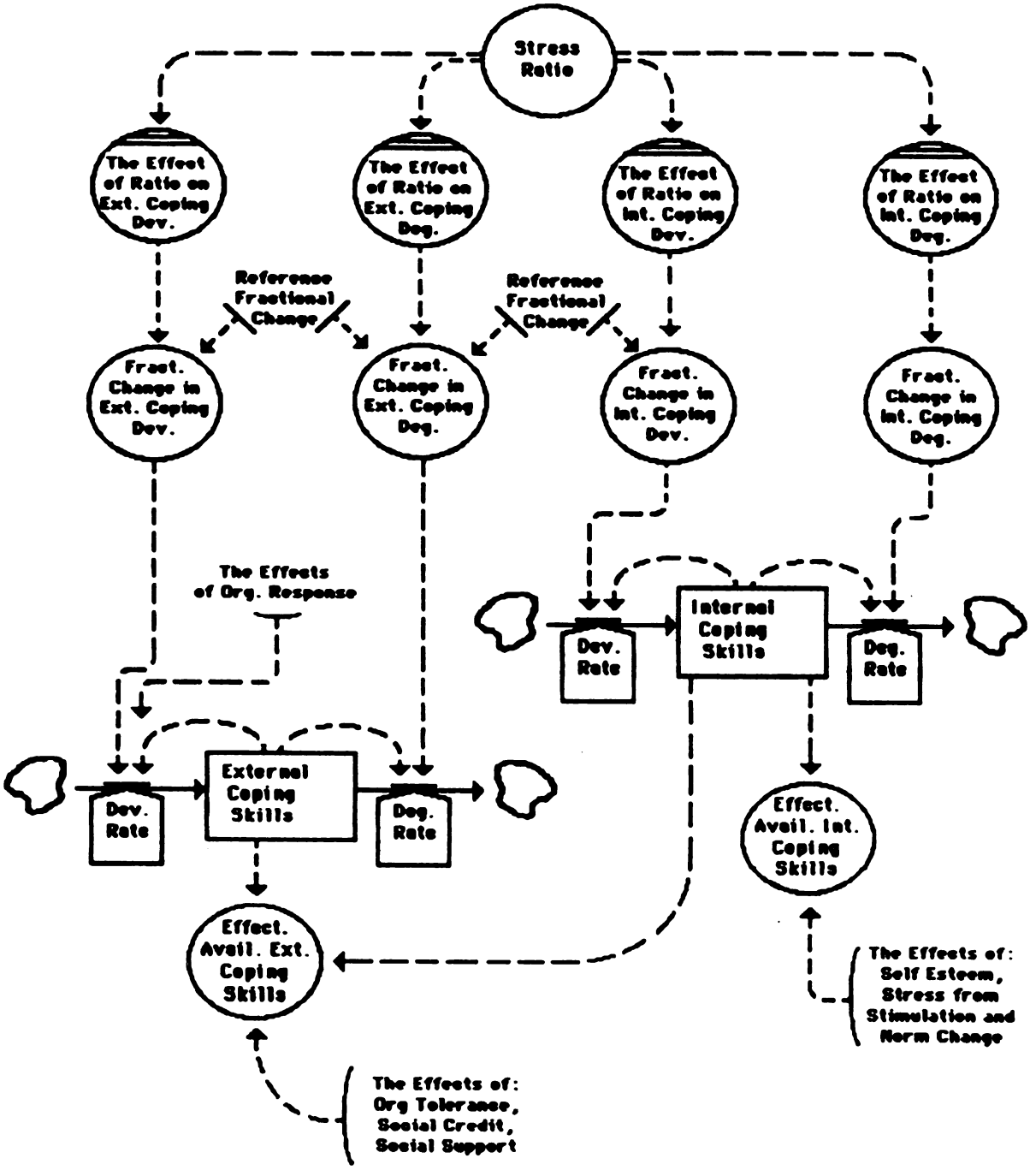

Figure 18. Coping skill rate/level flow diagram (adapted from Goluke, 1980).

gullibility. The more credulous the individual, the more readily stimulation norm adjustment will occur. This person does not rely on their own stimulation norm for guidance, but rather accepts the environment as the norm.

In addition to these internal coping skills discussed by Goluke (1980), external coping skills have been added to the model of sexual harassment. External coping skills act to inhibit the buildup of stimulation rather than increasing the response to it. In the model, external coping skills are used to stop sexual harassment instead of ignoring it or adapting to it.

Along with their different functions, internal and external coping skills differ in their development and degradation times. Internal skills take a great deal of time to develop, while external skills can be increased during the course of a training session. Such a training program might include information about grievance avenues and organizational policies or behavioral skill development through role-playing and assertiveness training. External coping skill development and degradation rates are amplified to reflect their greater variability.

The effect of the stress ratio on coping development and degradation is presented in Figure 19. While coping skills are used to reduce stress, their development is, in part, determined by stress. Stress at the optimal point promotes increased development of coping skills and decreased degradation of coping skills. At moderately high

levels of stress the development and degradation curves intersect. Beyond this point, the level of coping skills degenerates rapidly.

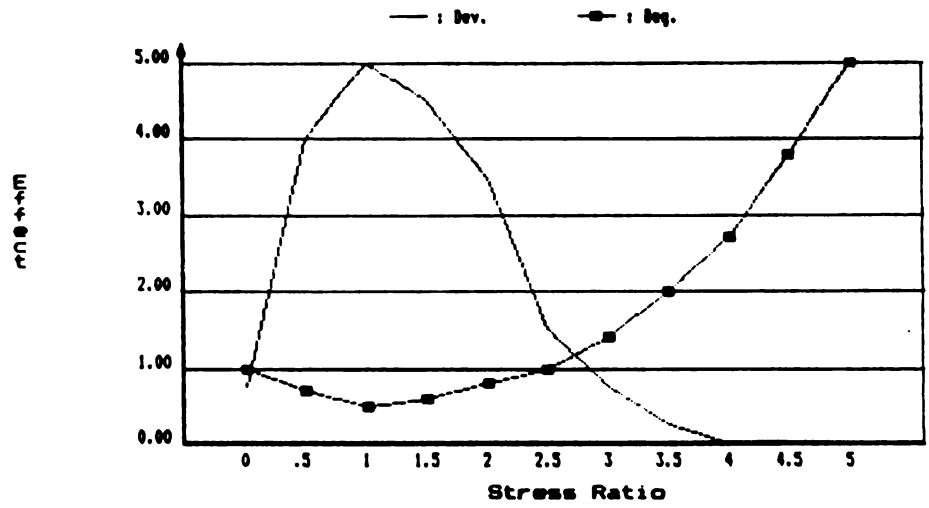

Figure 19. Effect of the stress ratio on coping skill development and degradation (adapted from Goluke, 1980).

Internal and external skills are not entirely independent. Internal skills form the basis for the development and utilization of external skills. Should internal skills be depleted due to extreme stress, external skills will also be depleted. It is assumed that the individual with a decreased ability to adjust his or her stimulation or norm would be unable to effect changes in the environment. For example, when internal coping skills have been reduced to the point where even getting out of bed in the morning is difficult, confronting a harasser or filing a grievance is nearly impossible.

Even though a sexual harassment victim may possess high

levels of coping skills, other variables are hypothesized to influence their effectiveness. Self esteem, for example, can influence the available internal coping skills. The victim's available external coping skills are moderated by the organization's tolerance of sexual harassment, social support available to the harassment victim, and the victim's social credit. More detail about the representation of coping skills is presented in the model representation stage of model building.

Social Credit

Social credit is comparable to a financial credit rating. A good rating allows one to take out larger loans at the bank. Similarly, a person with high social credit can borrow against that credit. Instead of buying cars or furs, this credit buys tolerance, credibility, power, and selective blindness from the organization. Although similar to organizational status, social credit is more encompassing, including socio-cultural variables not typically identified in the organizational structure. For example, although two people may hold comparable positions within the organization and receive the same pay, one of them may be liked more than the other. Given undesirable behavior, an organization treat the high and low social credit person differently. The liked individual may be told to do better next time, while the unpopular person may be less gently treated.

In terms of the model, social credit becomes important

when considering the validity accorded harassment complaints and tolerance of the victim's reduced job performance that may result from harassment. Social credit of the victim, harasser, and a victim/harasser social credit ratio are considered as key variables (see Figures 20 and 21). Victim social credit is a function of perceived performance, the social credit level itself, and a baseline social credit value.

If the organization perceives a performance drop, social credit will also soon decrease. But the time over which the organization evaluates performance is influenced by the victim's social credit. Several days of poor work for the low social credit victim may provide the organization a sufficient excuse for disciplinary action. The person with a high social credit rating may perform poorly for several years before action is initiated.

Other factors that may work to decrease the victim's social credit include harasser retribution and the pursual of grievance or legal proceedings. The harasser may seek revenge for noncompliance with sexual demands or refusal to participate in nonphysical sexual behaviors (e.g. leering). Retribution may take the form of rumors about the "wanton" nature of the victim or attempts to impugn his or her motives for initiation of informal or formal action. The organization tolerant of sexual harassment is also likely to respond negatively to formal grievance or legal action. The victim becomes a painful annoyance and embarrassment. In

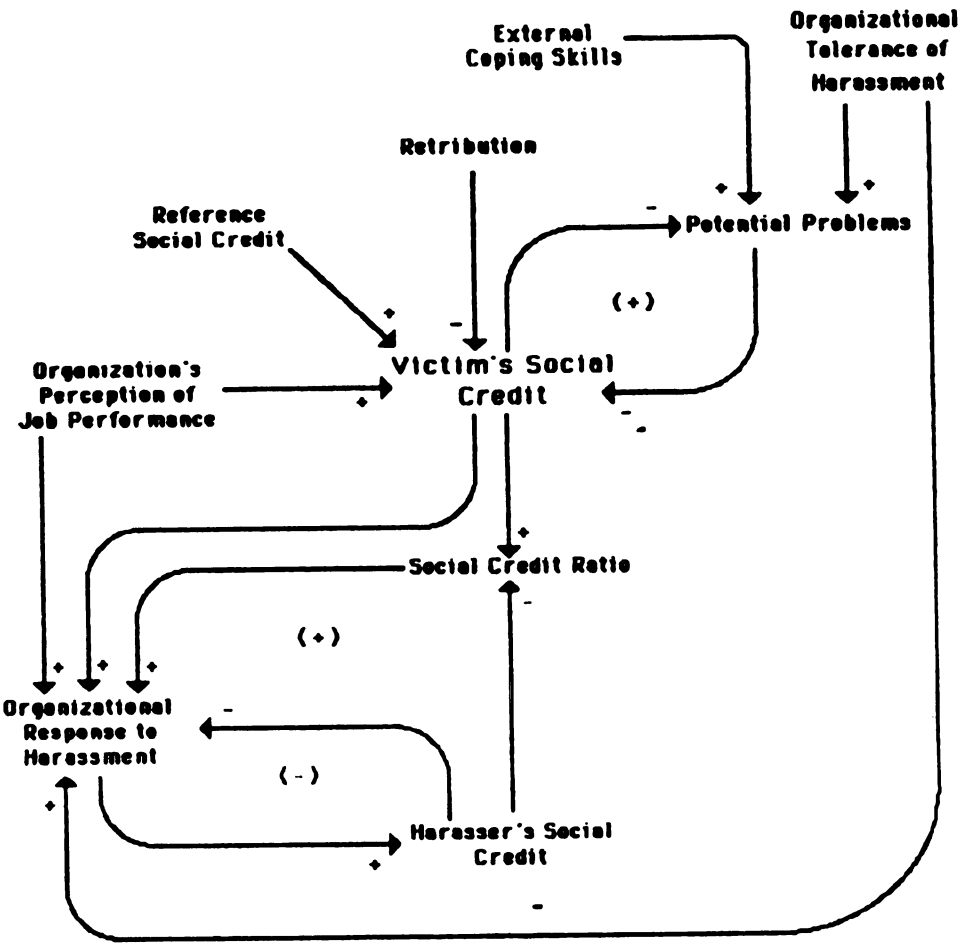

Figure 20. Victim's social credit causal loop diagram (adapted from Goluke, 1980).

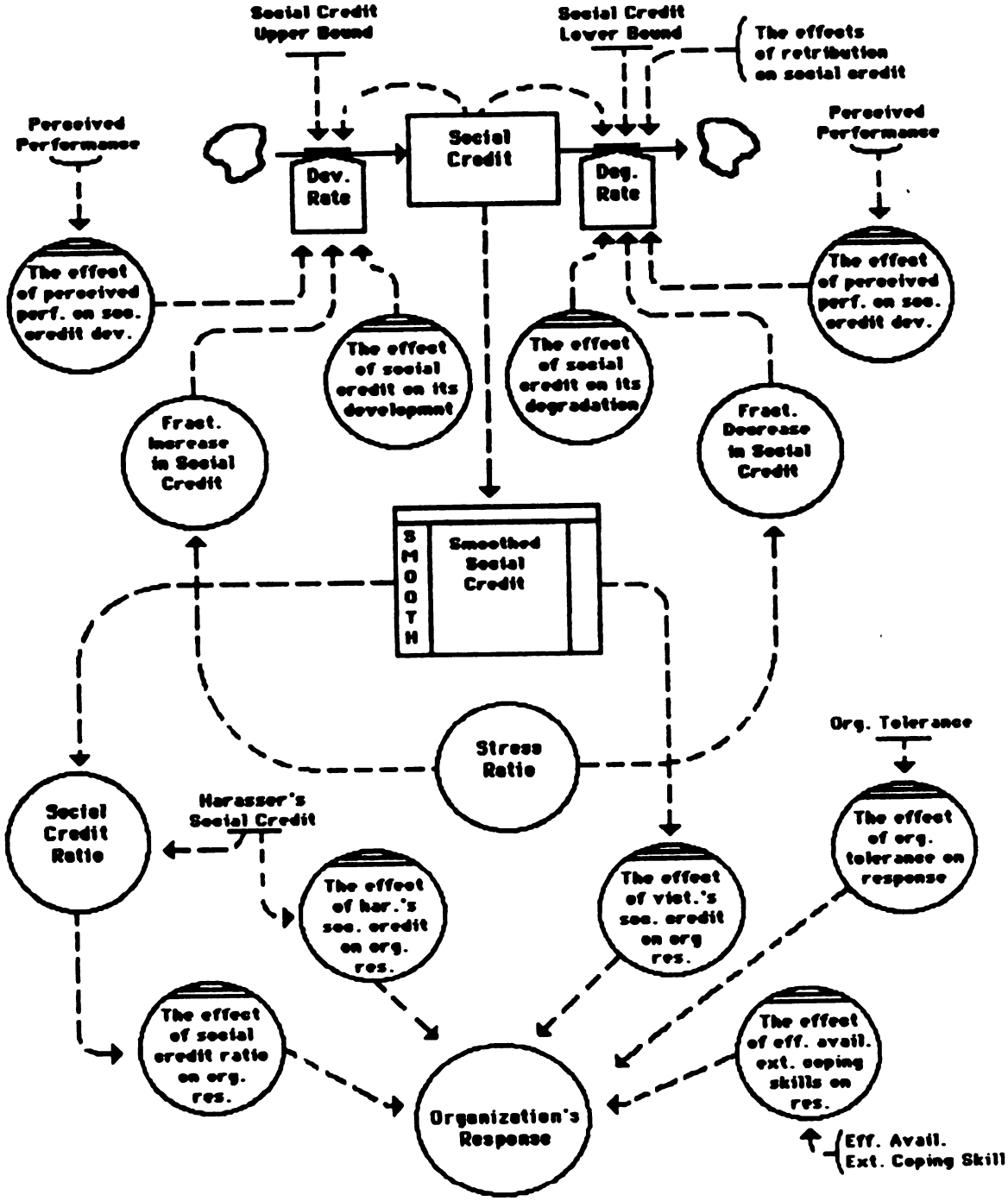

Figure 21. Victim's social credit rate/level flow diagrams (adapted from Goluke, 1980).

this instance, the "squeaky wheel" often gets the axe. This is particularly true of a low social credit victim with high levels of external coping skills.

Compliance

Compliance with a harasser's demands for physical and nonphysical sexual attention is hypothesized to be a function of the victim's perceived vulnerability and the severity of the sexual harassment (see Figures 22 and 23). A lack of available external coping skills, no job alternatives, and fear of retribution for refusal to comply contribute to the victim's feelings of vulnerability.

Compliance is also affected by the severity of the sexual harassment. While some victims may tolerate a joke and, to a lesser extent, leering or physical contact, they may refuse to have sex with the harasser regardless of the consequences. However, a single parent victim with five young children and no possibility of finding other employment may feel forced to comply. Another victim might refuse to comply under any circumstances.

The victim's fear of retribution may have a low correlation with the actual amount of retribution resulting from noncompliance. The harasser's immediate anger and threats of retribution may leave the victim feeling vulnerable, when in fact the harasser has no intention of retaliating. The fear of retribution is also affected by the victim's social credit relative to the harasser's.

For example, a female corporate vice-president is not

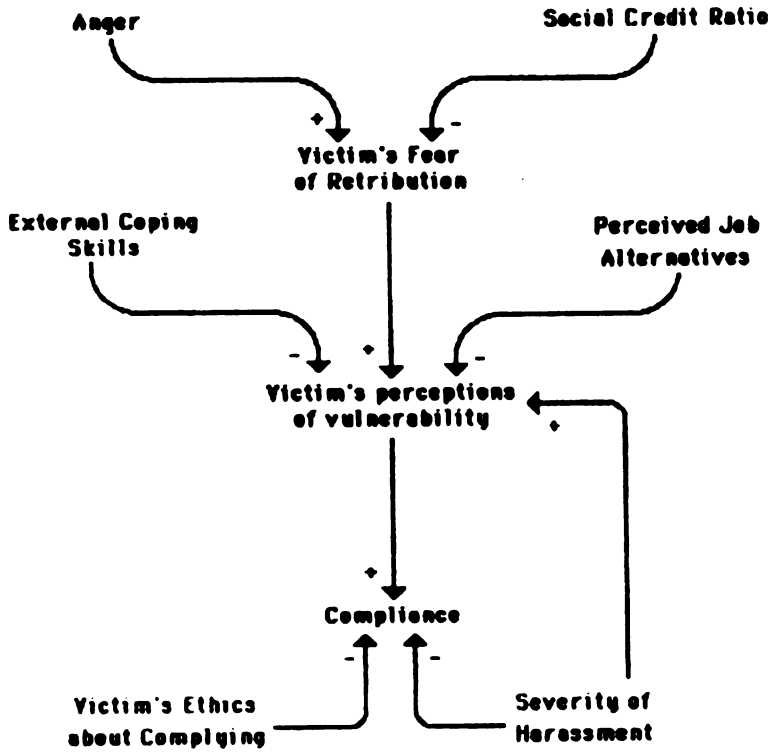

Figure 22. Causal loop diagram of victim's compliance with sexual harassment.

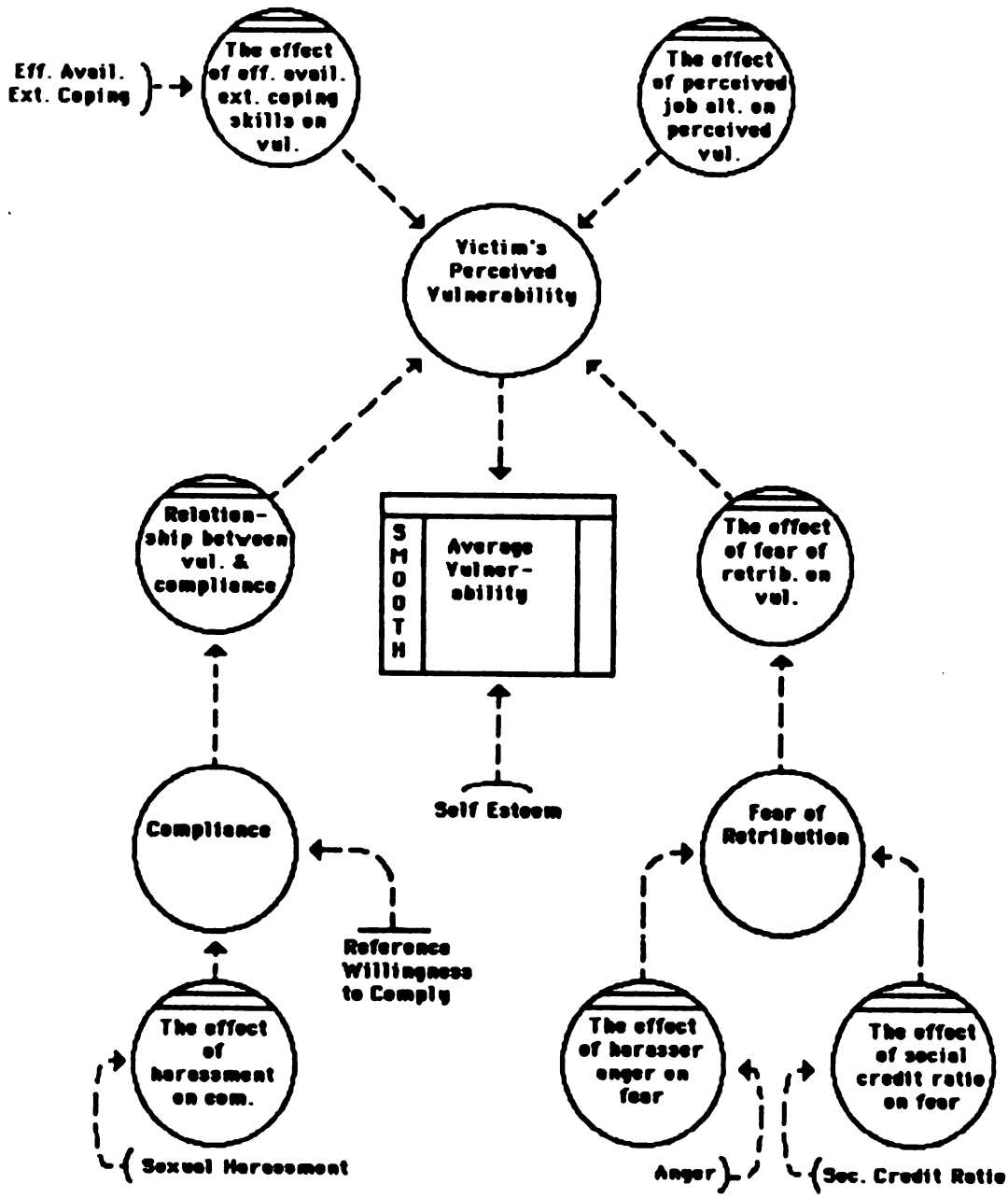

Figure 23. DYNAMO rate/level flow diagram of the victim's compliance with sexual harassment.

likely to feel organizationally vulnerable to threats of retribution from a male dockworker harasser. Although she may feel physically threatened, her stature in the organization is in little danger. This is not to dismiss threats of physical violence, but they are not likely to encourage compliance. They may indirectly influence social credit, however. Over time, this nonsexual harassment and the attendant stress increases may negatively affect job performance and social relationships, causing a decrement in organizational standing.

In this instance, a high social credit ratio decreases perceptions of vulnerability. In situations where the victim's social credit approximates or is less than the harasser's, the social credit discrepancy will increase feelings of vulnerability and the likelihood of compliance.

Job Performance

Job performance is hypothesized to be a function of the victim's reference, or baseline, performance moderated by the effects of the stress ratio. Curran (H.P. Curran, personal communication, January 11, 1984) and Powell et al. (1981) noted that many victims claimed their performance increased after the onset of harassment. Most were not able to sustain this increased level for any length of time, however. The dynamics of this phenomenon can be explained by the model.

As the inflow of stimulation is increased by sexual harassment, stress and the stress ratio also increase. This

increase in stress has a nonlinear impact on job performance. The inverted "J" relationship between stress and job performance has been well documented (e.g. Scott, 1966), and is depicted in Figure 24. By replacing stress, the independent variable, with the stress ratio, the mechanisms which cause job performance changes become clear. When stress reaches its optimal value, the victim's job performance peaks. The harassed women had increased stress levels that allowed them to perform better. If the harassment stops, job performance returns to a normal level. Continued harassment will increase stress beyond the value of optimal stress. Coping skills are being depleted faster than they are being developed. Self esteem and coping skill levels decrease, and, shortly thereafter, optimal stress also declines. As optimal stress, the denominator in the stress ratio, becomes smaller, the stress ratio quickly increases.

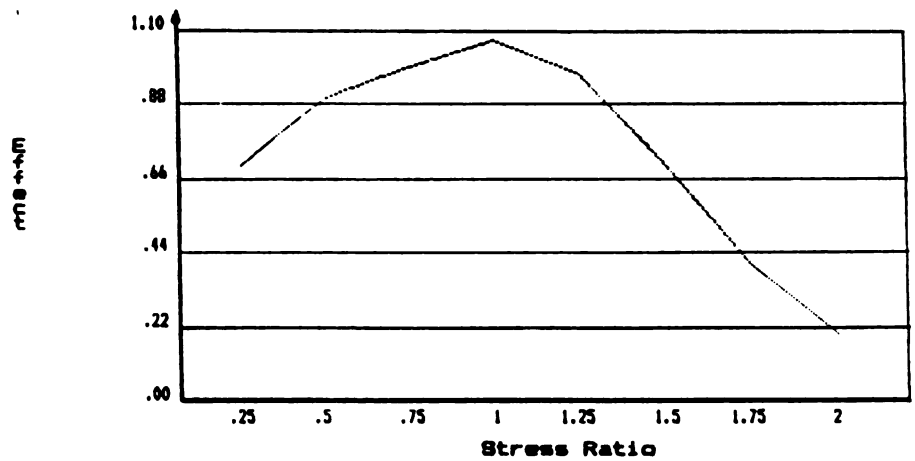

Figure 24. The effect of the stress ratio on job performance.

All things being equal, the organization's perception of a victim's job performance usually correlates with his or her actual performance on the job relative to other workers. But social credit, acting as halo error, and the effects of harasser retribution can increase the discrepancy between reality and perception. Compliance can also affect perceived performance. Acquiescing to the harasser's demands may gain the victim a promotion or raise. The harasser would justify these actions as being deserved by a very competent, valued employee. However, these positive effects of compliance are probably short-lived. On the other hand, complying with a harasser of equal or less social credit may be viewed negatively by the organization and coworkers. The victim may be seen as promiscuous and unprofessional.

Although in one study, many women reported no negative consequences to noncompliance (Curran, 1979), many victims do face retaliation for their harasser's embarrassment and anger (see Livingston, 1982). Retribution may appear in the form of deflated performance reviews when the harasser is a superior. These evaluations may be difficult to dispute, particularly in jobs where evaluation criteria are abstract. Sabotage or exclusion from teamwork are retribution avenues open to the coworker harasser. The relationship between the victim's actual performance and performance, as perceived by the organization, is presented in Figures 25 and 26.

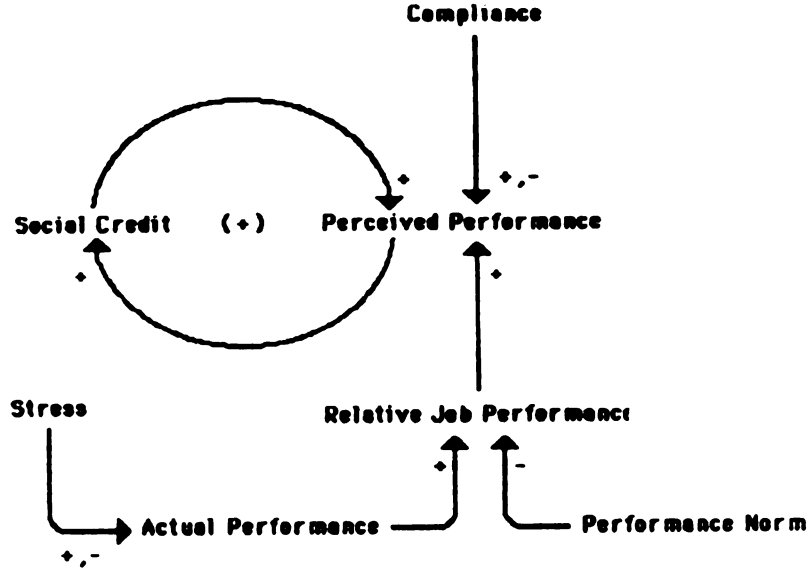

Figure 25. Performance and perceived performance causal loop diagram.

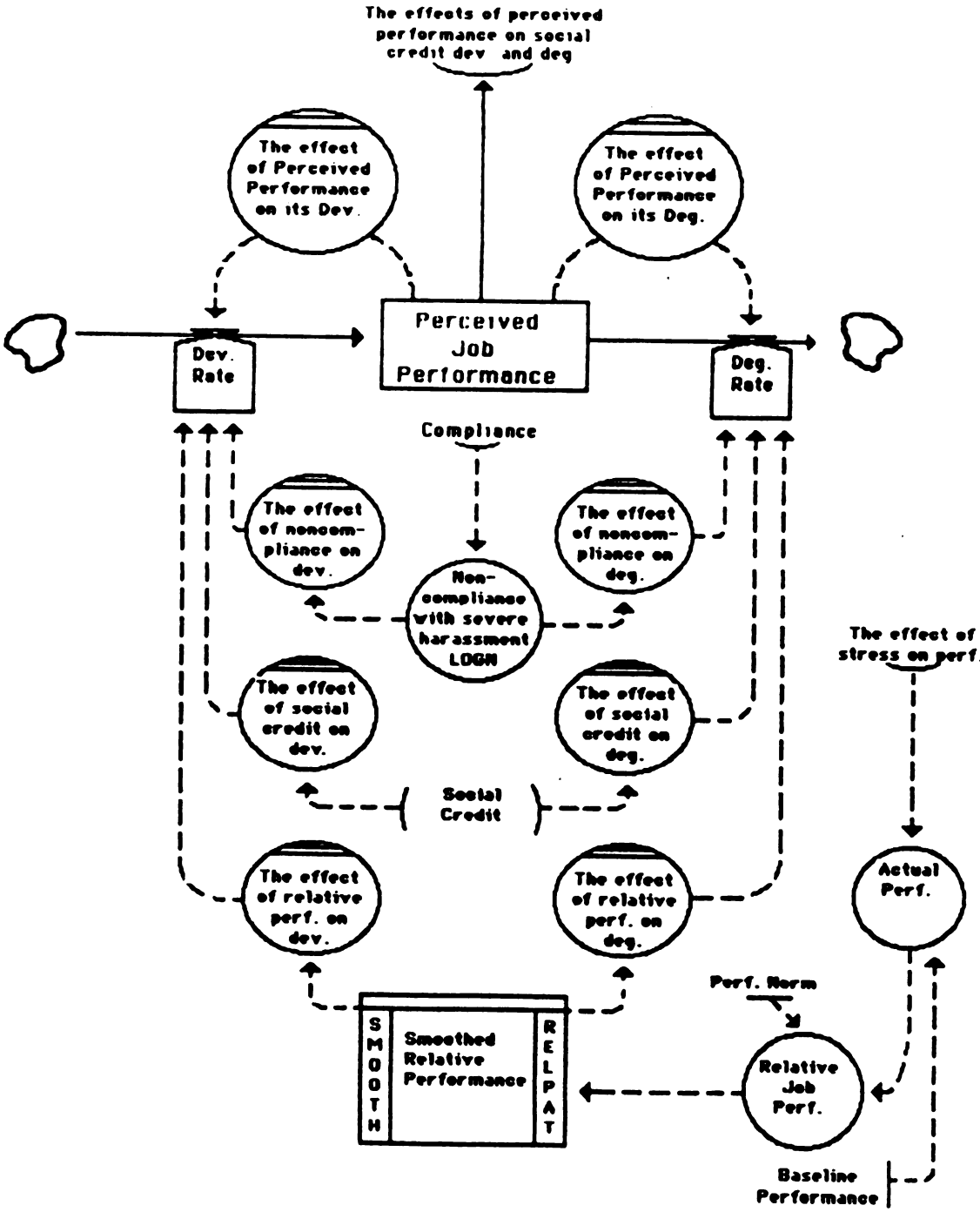

Figure 26. DYNAMO rate/level flow diagram of performance and perceived performance

Many women have quit their jobs because of sexual harassment (e.g. Curran, 1979). Rather than create a variable called "turnover," it is assumed that high stress ratios lead to "voluntary" turnover, while low levels of perceived performance and social credit are conditions for firing.

Social Support

Social support can be disaggregated into support from other workers and from sources outside of work. Social support from coworkers is influenced by their feminist attitudes and the extent to which coworkers have been harassed; the combination of support by coworkers, friends, and family can temporarily sustain the harassment victim. This is reflected in the model as a boosting of the available external coping skills.

Often there is a lack of support for the victim, due to other's attributions of the causal locus of sexual harassment to the victim. Curran (H. P. Curran, personal communication, January 11, 1984) noted that when harassment occurs, coworkers and family often believe the victim's behavior or dress invited the offending behavior. Even though women report that they themselves do not initiate or enjoy harassment, many believe that other women do (Gutek, 1893, Schneider, 1982). It can be seen, then, that social support can enhance or inhibit the available coping skills.

The Harasser

Harasser's Attitudes about Gender Work Roles

The harasser's attitudes about gender work roles are hypothesized to influence the likelihood of sexually harassing behavior. The conceptualization of gender work-roles includes, and is based on, the harasser's general sex-role beliefs. Because an individual with positive attitudes about women and men at work is less likely to overlap sex- and work-roles, he or she is less likely to harass in the first place. These attitudes have been modeled as a constant input to the system.

Anger and Retribution

Faced with a noncompliant victim, the harasser may grow angry because of embarrassment, fear of being caught and punished, actual punishment, and ego deflation. Additionally, high levels of anger can feed on itself, stimulating ever-increasing levels of anger. Of course, anger does not climb indefinitely. The model specifies two means for decreasing the anger level: venting and leakage (see Figure 27).

The venting of anger occurs after anger reaches a threshold beyond which the harasser cannot contain the pressure. The vented anger can be directed at coworkers or family, released through physical activity, or aimed at the noncompliant victim. The harasser may also focus the anger inward, blaming himself for inappropriate behavior. A distinction is made between anger directed at the victim and

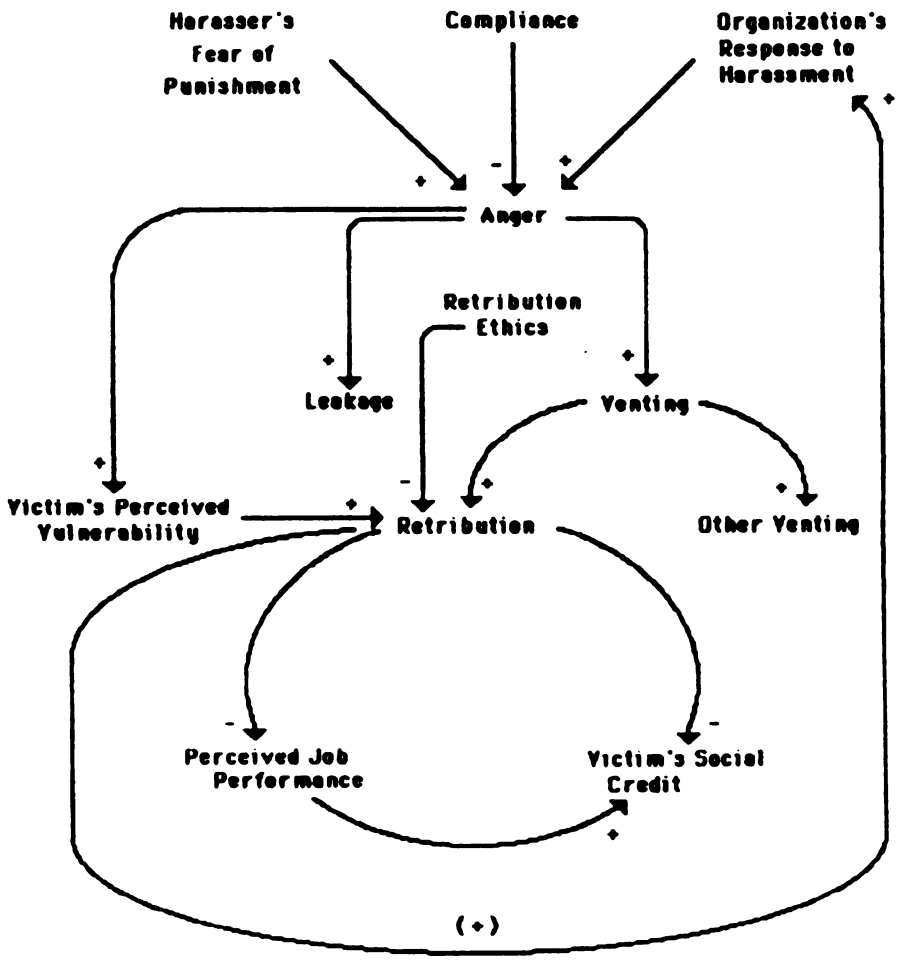

Figure 27. Causal loop diagram of anger and retribution.

retribution against the victim. While both may be stressful for the victim, once the former is completed things return to normal. Retribution is a more insidious, planned process that occurs over a longer period of time.

Because the model is structured in terms of harassment within an organization, anger can be vented either through retribution or through a generic venting process. Together, these processes produce the total venting of anger. Some people have ethics prohibiting retribution and vent their anger in other, more acceptable ways. Others may find retribution a perfectly acceptable venting process. Such a harasser, identified by an ethical system allowing for retribution, will only consider the possibility of getting caught before retaliating. But a very angry harasser may be too impassioned to consider the consequences of harassment behavior or want to get even in spite of the potential punishment. Once a very high anger threshold is reached, the crazed individual pushes ethics and fear of punishment aside, setting the course for reprisal. The threshold is, of course, an individual parameter.

Leakage is the second process by which the level of anger can be reduced. Leakage, a dissipative process, is more passive than the explosiveness of venting. An analogy of these two processes can be made to a paper cup with a pin hole in the bottom. Given enough time and no additional water placed in the cup, all the water flows out. The higher the water level, the faster it leaks out. But once

the cup reaches the top it also begins to spill over the top. The slow leakage through the bottom is the dissipative process, while the spillage is analogous to venting. In short, given enough time, people simply forget about their anger. But if anger builds quickly or consistently at high levels, it is vented.

Harasser's Perception of Threat

The harasser's perception of threat from either the victim or the organization may prevent some sexually harassing behaviors. The victim's refusal to submit to harassment, the organization's tolerance of harassment, and the success of previous harassment contribute to the harasser's fear of being caught and punished (see Figure 28). The likelihood of punishment is influenced by the victim's available coping skills, the organizational tolerance of harassment, and the organizational response to harassment.

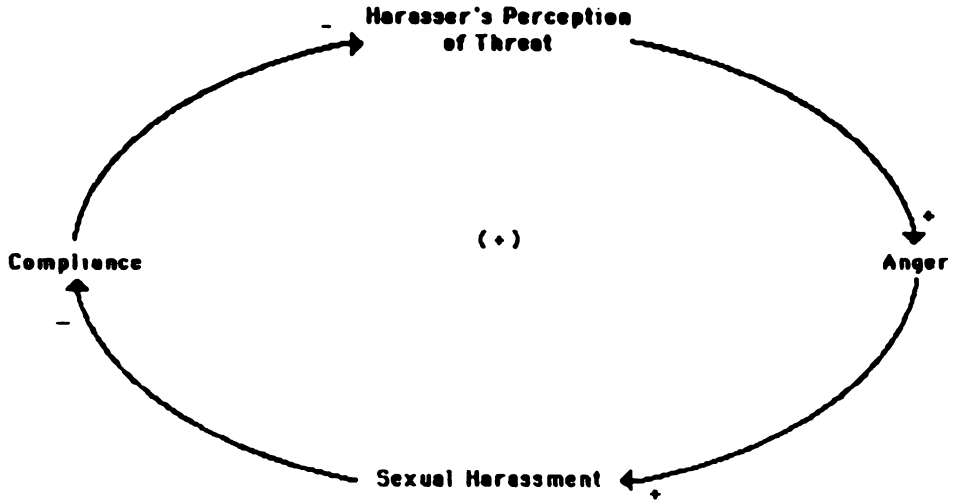

Figure 28. Causal loop diagram of the harasser's perception of threat.

The victim who confronts rather than submits to the harasser poses a threat. If the victim pursues the matter, the harasser could face censure or possible termination. The relevant causal factor here is the victim's available external coping skills, rather than the actual level of external coping skills. The available coping skills are affected by environmental factors that might prohibit an external response like confrontation or initiation of formal proceedings.

An organization's tolerance of harassment influences the degree to which the harasser fears punishment. An organization that encourages harassment poses little threat to a harasser confronted by a high-coping victim. Additionally, the harasser who has gotten away with harassment in the past may not even consider the possibility of punishment.

The Organization

Harassment Tradition

Due to changes in the legal or ethical climate, the organization's harassment tradition may not equal the organizational tolerance of sexual harassment. The harassers within a organization may not believe the organization is now intolerant of sexual harassment. Victims may also be slow to trust the organization and take a wait-and-see attitude before beginning to use grievance resources.

Organizational Tolerance of Sexual Harassment

Organizational tolerance of sexual harassment is a function of the long-standing harassment tradition. Although related, there is an important distinction between the harassment tradition and the organization's tolerance of sexual harassment. The harassment tradition is a phenomenon that evolves over a long period of time. An organization tolerant of harassment behavior can dramatically reduce the effectiveness of a victim's external coping skills, especially if there are few external support avenues.

Organizational Response to Sexual Harassment

An organization's response to sexual harassment is determined by its tolerance level, victim, and harasser social credit, the social credit ratio, and the victim's effectively available external coping skills (see Figure 29). Before the organization can respond, the victim must use coping skills to alert the organization that harassment is a problem.

Both the actual levels of victim and harasser social credit, as well as their relative value, are considered in the organization's response to sexual harassment. High status harassers and victims will likely evoke a less vigorous response that those with low social credit. This is due to the organization's desire to keep their high social credit people. The social credit ratio, on the other hand, considers the relative social credit discrepancy between the harasser and victim. Punishment of a sexual

harasser is a function of the strength of the organization's response.

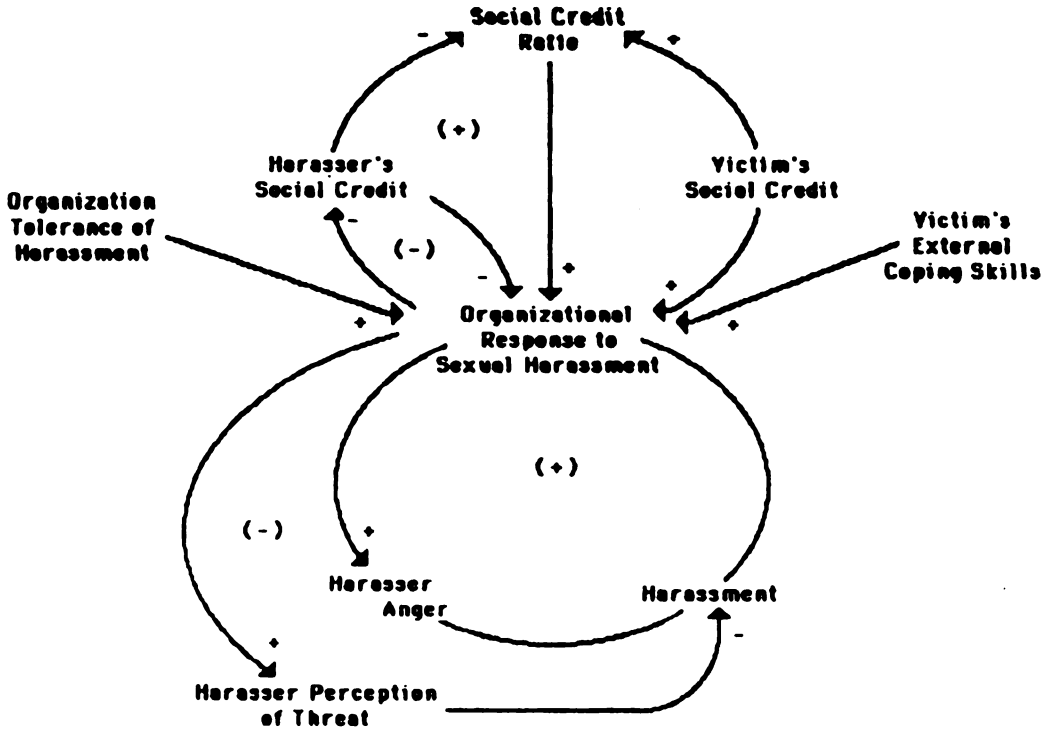

Figure 31. Causal loop diagram of organizational response to sexual harassment.

Step 3: System Representation

In this section, the flow diagrams representing the dynamics of the sexual harassment system are translated into DYNAMO equations. Once entered into the computer, the system can be simulated. For those readers interested in this technical phase of model development, the equations detailing the victim, harasser, and organization sectors are presented in Appendix B.

Step 4: Model Behavior

Step 4 examines the behavior of the system dynamics model of sexual harassment model over time. Through the simulation of the DYNAMO program described in Step 3 and presented in Appendix B, the structure and behavior of the sexual harassment system can be better understood. As depicted in Figure 1, this phase of model building is related to model evaluation. The model should reproduce the system's reference modes. That is, the behavior of the model variables should correspond to the behavior of those variables in the actual system.

For example, as was stated earlier, many women report that their job performance climbed after the onset of sexual harassment (Curran, personal communication, January, 1984, Powell, et al., 1981). Other system behaviors that the model should be able to reproduce include such things as increased stress, decreased self esteem, fear of retribution, and decreased job performance. Because of the many individual difference variables hypothesized to exist in the dynamics of sexual harassment (e.g. self esteem, coping skills, and social credit), the model is able to simulate a variety of uniquely parameterized "people."

However different they may be, though, one would expect that they will all be negatively affected by sexual harassment to some degree. Those individuals with high coping skills and self esteem may be able to postpone or reduce these effects better than others, but nonetheless,

they will be affected. Qualitatively, one can expect the behavior of the model to be similar for all individuals, differing only in the quantitative dimension.

The results of several simulation runs are presented below. The system at equilibrium is first discussed, and the results of disturbances to the system are then described. Perturbations ranging from mild to severe harassment and harassment environments and their effects on the victim are detailed. The parameter changes that distinguish these simulations are presented in Table 7.

Simulation Number 1: Equilibrium

The model has been set to operate at equilibrium. This was accomplished by setting the inflow rate equal to the outflow rate for each state variable. For example, the coping skill development rate is equal to the coping skill degradation rate. The level of coping skills then remains constant. There is no sexual harassment in the equilibrium condition, and the victim's stress, self esteem, coping skills, and social credit remain constant. Having described the system in equilibrium, it is now possible to examine the effects of sexual harassment in the organization.

Simulation Number 2: Modal Run

Figure 30 depicts a sexual harassment victim in an organization with an average harassment tradition and tolerance. The simulated harasser has a fairly negative view of women at work. The simulation begins at the onset of moderate amounts of sexual harassment. Over the next two

Table 7. Parameters for simulation runs.

	Simulation				
	1	2	3	4	5
Parameter					
Harasser's attitudes about gender work roles	1	-.5	-1	.4	0
reference stimulation arrival rate	.6	1.2	1	.6	.6
Organizational tolerance of sexual harassment	.5	.5	1	.4	.45
Harasser's inital anger	0	0	1	0	0
Harasser's retribution ethics	.2	.2	1	0	.5
Harassment tradition	.5	.5	1	.5	1
Victim social credit	.5	.5	.4	.5	.5
Harasser social credit	.75	.75	.8	.75	.75

weeks, job performance climbs dramatically before it begins to decrease. By the eighth week performance has returned to its normal level.

In this instance, the victim possessed sufficient coping skills to reduce the sexual harassment. Had this particular victim been under severe stress from more serious sexual harassment or other stressors, job performance would have dropped below its original value. Low levels of social credit, self esteem, or coping skills also would make it likely that performance would drop below the original value.

Simulation Number 3: Extreme Harassing Environment

Figure 31 details the decline of a harassment victim's coping skills in an environment that encourages sexual harassment. The simulated victim has only half the social credit of the harasser. The organization has a very strong sexual harassment tradition and a high harassment tolerance. The harasser is already fairly angry and has no qualms about using retribution as a means to reduce that anger. As can be seen, external coping skills and effectively available external coping skills decline much more rapidly than the actual and effective internal coping skills.

The external coping skills are more greatly influenced by the vagaries of the external environment. Because of the organization's tolerance of sexual harassment, the available coping skills have been significantly dampened. Decreasing self esteem reduces the available internal coping skills relative to the actual level of internal skills.

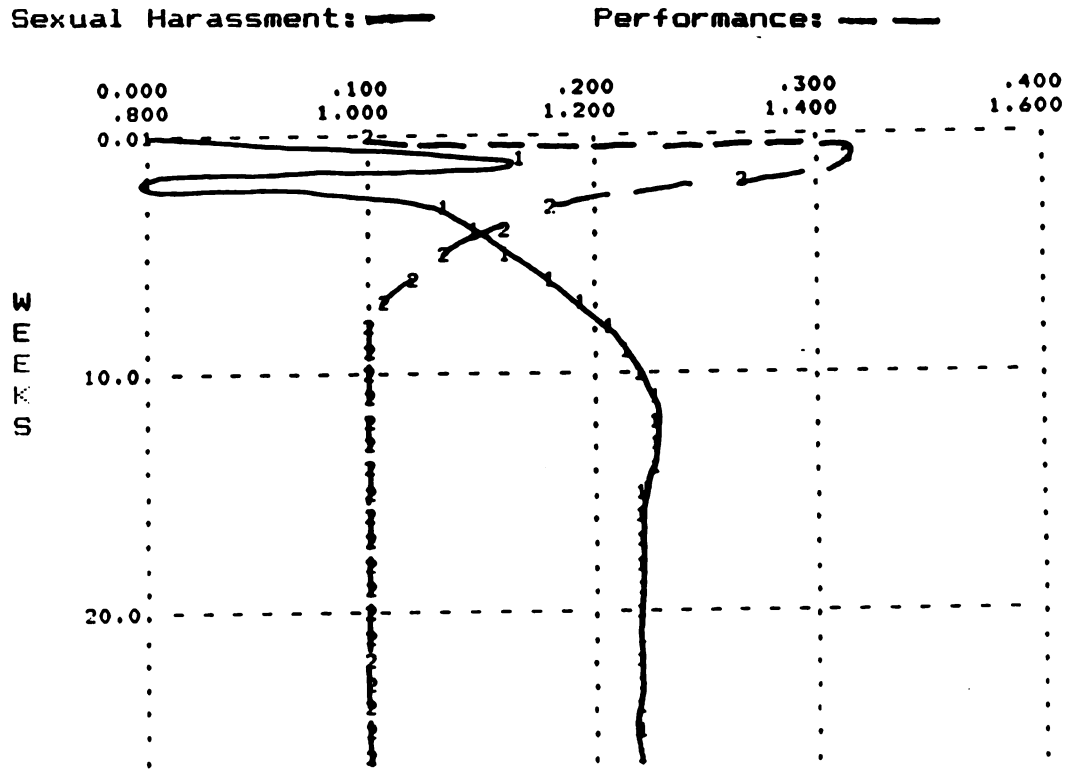

Figure 30. Performance increase as a result of sexual harassment.

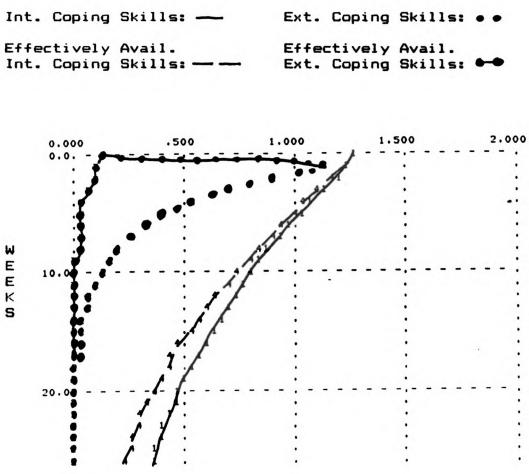

Figure 31. Decrease in coping skills as a result of severe sexual harassment.

Faced with this severe an environment, an abnormally large amount of external coping skills would be necessary to counteract the effect of organizational tolerance on available external coping skills.

Simulation Number 4: Low Harassment Environment

The different growth patterns of internal coping skills and external coping skills are presented in Figure 32. This sexual harassment victim is undergoing a buildup of coping skills. Self esteem, a moderator of the available amount of internal coping skills, is fairly high, so that the actual level of internal coping skills and the available amount of internal coping skills are equal. The would-be harasser feels fairly positive about women in the workplace and does not consider retribution an acceptable means to vent anger. The organization is relatively intolerant of sexual harassment and is slightly less tolerant than its tradition would indicate. This particular organization is attempting to change its harassment climate.

One notices two important features of this graph. First, external coping skills (EXTC) and the available external coping skills (EAEC) are developing at a much faster rate than their internal counterparts. It is hypothesized that individuals can more easily adjust the way in which they cope with their external environment than with their internal one. For example, it is probably faster (and easier) to train someone how to confront a harasser to reduce harassment than it is to teach someone to adjust

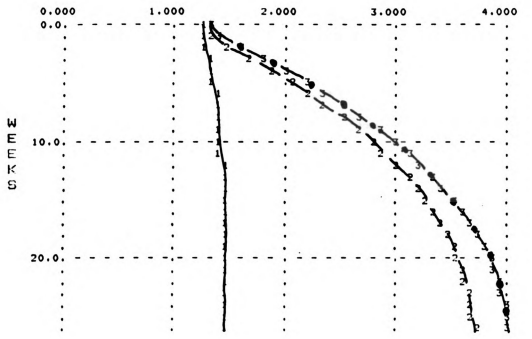

Figure 32. Growth patterns of internal and external coping skills.

their stimulation and stimulation norm levels. Attempts to change the belief system of a dogmatic individual are probably fruitless.

The second feature of this graph is that the available coping skills are developing slightly faster than the actual level of external coping skills. This difference between actual and effective external coping skills would increase as the organization becomes increasingly intolerant of sexual harassment. A highly intolerant organization may overreact to harassment complaints and effectively exaggerate the victim's external coping skills. In addition, the intolerant organization is more likely to take action to reduce the amount and severity of sexual harassment. Training programs detailing methods of dealing with sexual harassers are one behavioral example of this phenomenon.

Simulation Number 5: Medium Harassment Environment

Extreme amounts of sexual harassment are not necessary to cause problems for the victim. The victim depicted in Figure 33 works in a relatively tolerant organization. The harasser is ambivalent about women in the workplace, and is moderately harassing. The organization has a strong tradition of sexual harassment, but is attempting to change. Its tolerance of sexual harassment is now forty-five percent its original value. As can be seen in Figure 33, the victim's self esteem gradually falls over a six month period. Because the highly field dependent victim relies on

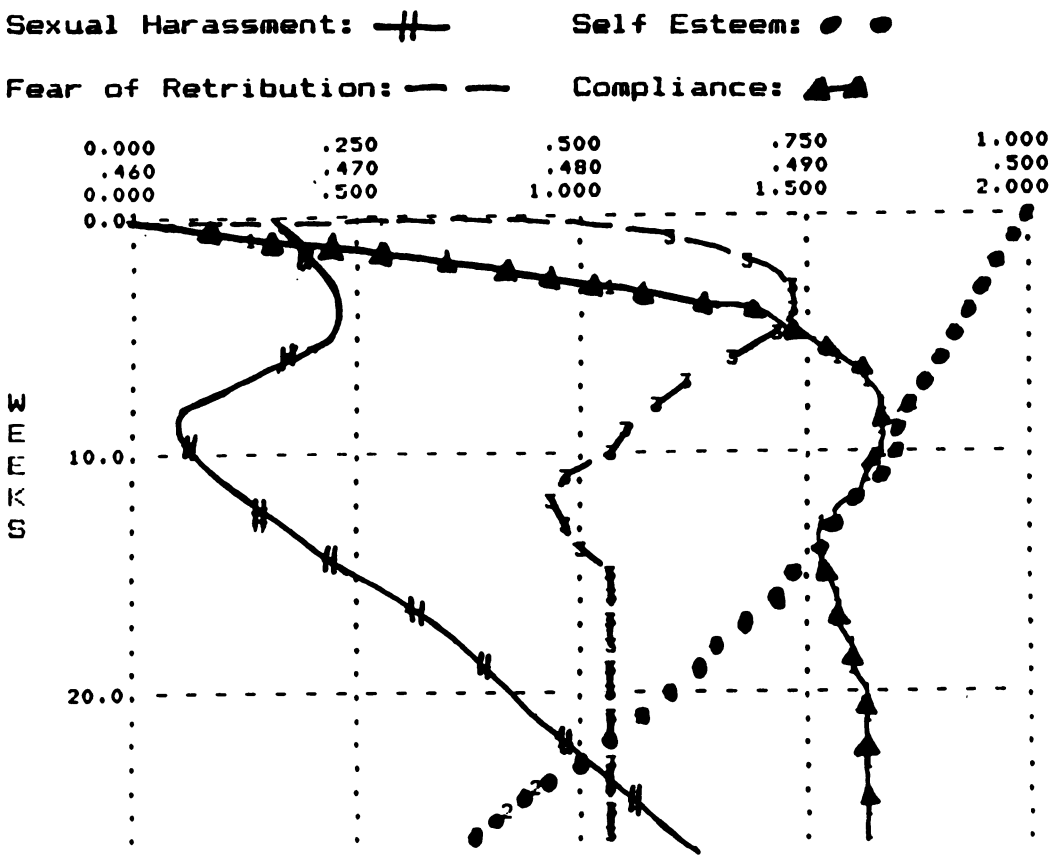

Figure 33. The effects of moderate sexual harassment on compliance, self esteem, and fear of retribution.

external cues for an estimation of self worth, his or her self esteem would degrade at an even faster rate. Continued harassment or poor initial self esteem would also negatively affect self esteem.

This uniquely parameterized victim is also very fearful of retribution from the harasser. After the second week, the harassment becomes less severe. Qualitatively, the curve depicting the victim's fear of retribution from the harasser closely follows that of harassment until the tenth week. As the harassment decreases, the victim's fear of retribution does not decrease. The victim will be fearful for some time. Only a period of weeks or months of no harassment or retribution does the victim become less fearful.

With a slight time delay, the curve depicting the victim's compliance with the harasser follows his or her fear of retribution. The delay is a result of the time lag between the victim's perceived vulnerability because of fear of retribution and the decision to comply with the harasser. Unlike the victim's fear of retribution, compliance decreases as the harassment decreases. There is less sexual harassment with which to comply.

Step 5. Model Evaluation

The fifth phase of model development uses a variety of tests to evaluate the representativeness of the model. Tests applicable to the model of sexual harassment include most of the tests of model structure, behavior, and policy

presented in Table 5 and discussed in detail in Chapter III. To demonstrate the iterative nature of the model evaluation and confidence building, the stage at which each test is conducted is presented in Table 8.

Table 8. The role of model confidence building tests in the iterative process of system dyanamics model development.

Step 1: Problem Definiton
Boundary adequacy (structure)

Step 2: System Conceptualization
Structure verification
Parameter verification

Step 3: Model Representation
Dimensional consistency

Step 4: Model Behavior
Extreme conditions (structure)
Behavior reproduction
Family member
Extreme policy
Behavior sensitivity

Step 5: Model Evaluation
Changed-behavior prediction
Policy sensitivity

Tests of Model Structure

The structure-verification test compareS the model's structure with that of the actual system. The model's behavior was compared with that observed by experts in organizations, victim case studies, and results of empirical research. The basic assumptions of the model were confirmed by subject matter experts (e.g. H. P. Curran, personal communication, January 11, 1984).

Parameter verification is similar to structural

verification. Both of these tests attempt to define the decision-making processes of the system. Structure verification defines the flow of information and materials, while parameter verification determines the extent to which the flows affect the system. The parameters affecting the system should then reflect those in the system. Because of the abstract nature of most of the model variables, this test is not applicable. The parameters are tested, however, in the tests of model behavior.

Tests of extreme conditions can be used to test the representativeness of the model's structure. Because the system exists within the context of an organization, extreme values are not usually found. Nevertheless, it is vitally important to "push" the model to extreme limits to test its ability to explain less severe conditions. A model that fails under extreme conditions is most likely flawed.

For example, the victim of unusually severe sexual harassment should also suffer from extremely high stress. This test was conducted by drastically increase the inflow rates for the level variables. These variables included stimulation and its norm, self esteem, internal and external coping skills, victim social credit, harasser anger, and organizational response to sexual harassment. These tests all produced results that might be expected under the circumstances. An example of extreme results tests was presented in Figure 31. By dramatically increasing the stimulation (via sexual harassment) and therefore stress,

coping skills were significantly decreased.

The structural boundary-adequacy test was used to evaluate the appropriateness of the model's level of aggregation and the boundaries that define it. In developing a theory of sexual harassment in the organization, the boundaries were established around the harassment victim, the harassment perpetrator, and the organization. As stated in Chapter II, the empirical literature and subject matter experts support the use of these boundaries.

Scale consistency was tested in the system representation phase of model development (Step 3). This test can expose structural problems in the model. The rate equations were checked to ensure that both sides of each equation were consistent. For example, the coping skill development rate metric is "coping skill units per week." Should the right side of the equation reduce to just "coping skills," the modeler is aware that time has been omitted from that side of the equation. All the equations developed in Step 3, and presented in Appendix B, are consistent.

Tests of Model Behavior

The behavior-reproduction tests compare the model's behavior with the actual system's. The symptom generation test showed that the model could indeed reproduce the problem of sexual harassment. That level variables such as coping skills, self esteem, and organizational response to

harassment could display both growth and decline satisfied the multiple mode test. The ability of the model to explain the performance increases reported by some harassment victims (e.g. Powell, et al., 1981) is one indication that the model passed the behavior-characteristic test.

The family-membership test is conducted by applying a general theory of one phenomenon to that of another in the same system family. The dynamics of stress, coping skills, and self esteem (Goluke, 1980); prejudice, discrimination, and perceived and actual job performance (Frohman et al., 1978); and compliance (Richmond, unpublished) explored by others are applicable to the problem of sexual harassment in the organization. Additionally, the applicability of the model to a wide variety of victims, harassers, and organizations, as demonstrated in Figures 30 through 33, increases confidence in the models representativeness.

The extreme-policy test is analogous to the extreme conditions test. To simulate extreme policies, the organizational tradition and organizational tolerance of sexual harassment were assigned extreme values. All things being equal, the victim in an organization that encouraged sexual harassment was seriously affected. Coping skills, self esteem, job performance, and other variables were significantly affected (see Figure 33 for the effect on coping skills).

The model's sensitivity to parameter changes was tested according to the behavior-sensitivity test. Parameters in

various auxiliary equations (see Appendix B) were changed. These auxiliary equations specify the relationships between variables. Assuming they did not cause a change in the direction of the relationship, the new parameters acted only to change the speed at which that particular variable behaved.

For example, flattening out the relationship between the stress ratio and job performance (presented in Figure 24) acted only to minimize the performance increase and slow the performance decrease when the stress ratio was greater than one. In short, most parameter changes do not qualitatively affect the behavior of the model.

However, parameter values that are genuinely sensitive to parameter changes are potential policy intervention points. Two such variables are the organization's tolerance of sexual harassment and the victim's effectively available coping skills. Separately, they held little influence on the system. But coping skills that were supported by the organization (i.e. low tolerance of harassment) were effective in reducing sexual harassment.

Several tests of model behavior presented in Table 5 were not applicable to the model of sexual harassment. The behavior-prediction test is most applicable in field applications where the model is used to forecast trends in the system. The behavior-anomaly and surprise-behavior tests are used to explain bizarre or unexpected model behavior. Since the model did not present any extraordinary

results, these tests have been omitted. Finally, computer limitations prevented the addition of other, perhaps relevant, structures that would have been used in the conduct of the behavior-adequacy (behavior) test.

Tests of Policy Implications

The changed-behavior prediction test examines the model's ability to predict the system's behavior under different policies. To test the effect organizational policy changes might have on sexual harassment, the organization's tolerance of sexual harassment was was reduced.

This test concerns the model's ability to predict changes in the system when various policies are implemented. In the sexual harassment model, policy changes can be implemented through organizational tolerance and response to sexual harassment. An organization intolerant of sexual harassment will most likely offer training programs, institute grievance procedures, and disciplinary measures for dealing with sexual harassers. The effect of this decreased tolerance is then simulated. Not only are more external coping skills then made available, but external coping skill development increases as well.

Finally, the policy sensitivity of the model is considered. Insensitivity to parameter changes indicates that implemented policies will most likely have a similar effect on both the model and the actual system. As was stated above, the model remained qualitatively unaffected by

parameter changes.

The system-improvement test was not conducted for reasons outlined in Chapter III. The boundary-adequacy (policy) test is analogous to the structural and behavioral boundary adequacy tests. It was not possible to conduct this test because of the computer limitations mentioned above.

Step 6. Policy Analysis and Use

Having developed confidence in the model's structure and behavior, the implementation of various policies was simulated. Because of computer memory limitations, greater disaggregation of the organization's effect on system (viz. informational and behavioral training programs and the organization's response to other known victims) was not possible. Therefore, policy testing is limited to testing the effects of changes in the organization's tolerance of sexual harassment.

Figure 34 shows the effect of decreased organizational tolerance on the system. Simulated over a two year period, the organization's tolerance of sexual harassment is abruptly changed after the first year. The organization was initially parameterized as being very tolerant of sexual harassment. After one year the tolerance was reduced to one-tenth of its original value. As can be seen, although sexual harassment sharply decreases, it soon climbs back towards its initial value. This is because the harassment tradition has yet to change, and the harasser does not

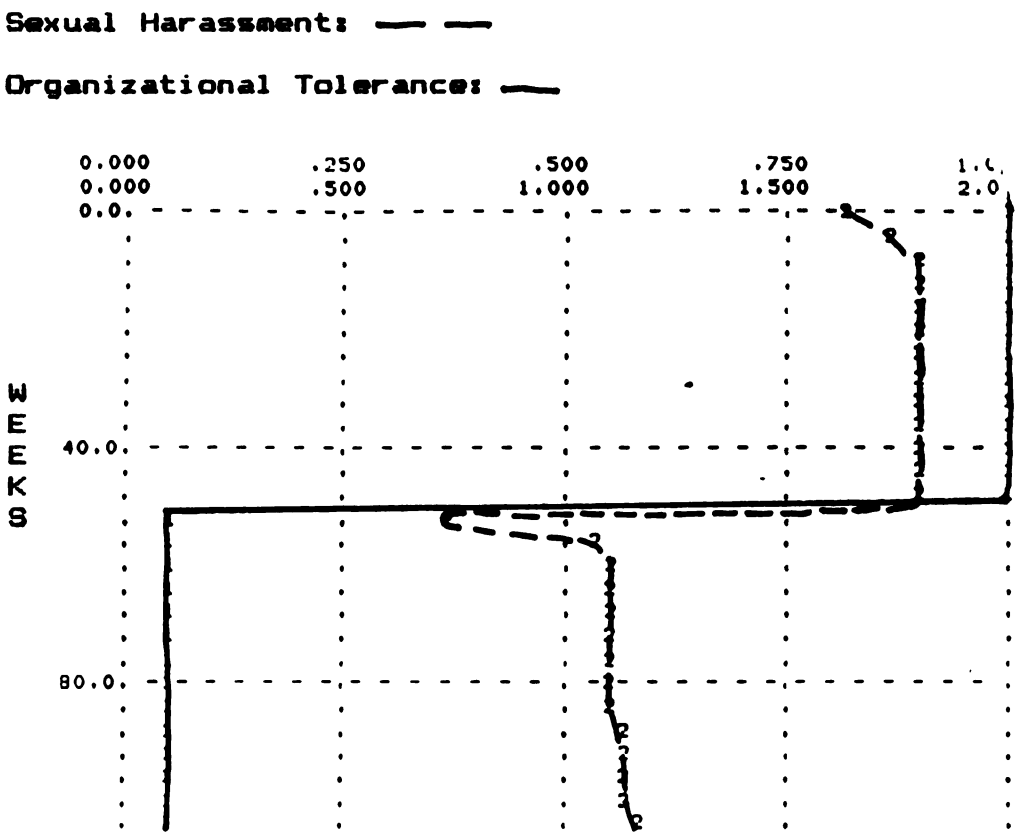

Figure 34. Shift in organizational tolerance of sexual harassment.

believe the organization is sincere about its intolerance of harassment. Within several weeks, however, the harasser comes to realize the organization will not tolerate sexual harassment, and harassment behavior is decreased.

Although this exaggerated a tolerance change is unlikely to occur in a real system, Figure 34 does demonstrate the applicability of the systems approach to the problem of sexual harassment. Clearly, a change in tolerance is not enough to stop the harassment. But perhaps combined with training programs, and other acts of good faith, the victims and harassers may come to see that the organization is sincere in its new intolerance. Over a period of several years, a time frame outside the dynamics of this model, one would expect that the harassment tradition would begin to reflect the organizational tolerance.

Summary

This section presented the system dynamics model of sexual harassment. The conceptualization of the model in terms of the victim, sexual harasser, and organization was discussed. Variables previously defined as necessary to the proper consideration of the system were outlined. Their hypothesized inter-relationships were developed in the form of causal loop and DYNAMO rate/level flow diagrams. Computer equations representing the sexual harassment system were translated from the flow diagrams and simulated. The behavior of the model and its representation of the

harassment system were presented. Finally, traditional systems techniques were used to evaluate the model and its policy implications were discussed.

Discussion
Conclusion and Empirical Recommendations

This section discusses the theoretical and practical contributions of the system dynamics model of sexual harassment. The system dynamics model of sexual harassment integrated the previous sexual harassment research and broadened it to include the harasser and the organization in which harassment occurs. Additionally, feedback was introduced to the model through the use of system dynamics. Structures from dynamically similar systems (e.g. alcoholism, Goluke, 1980) have been adapted to the dynamics of sexual harassment. The structure of other psychological and social phenomena were also dynamically hypothesized. Practical contributions in terms of potential system interventions are presented. Implications for future system dynamics and more traditional, empirical research are discussed.

Theoretical Contributions of the Model

Integration

The biological, organizational, and socio-cultural harassment models (Tangri, et al., 1981); and the spillover approach (Gutek & Morasch, 1982) were integrated in the dynamic model of sexual harassment. The biological approach assumes that harassment is a function of natural attraction

between people. The harasser simply does not realize the effect of the harassment on the victim. This harasser will stop making sexual overtures when the victim indicates they are not appreciated. A relatively low level of coping skills is needed to stop the harassment stemming from natural attraction.

The use of the harassment tradition and organizational tolerance, as well as victim and harasser social credit and the social credit ratio, in the dynamic model represents the organizational approach. Organizations with strong traditions of sexual harassment often condone or encourage it. The victim's and harasser's social credit and ratio, in part, determine how strongly the organization responds to sexual harassment complaints. The harasser with very high social credit will elicit a milder response than a mailroom clerk. This is particularly true if the victim has much less social credit than the harasser.

The socio-cultural approach is represented in the dynamic model by the harasser's attitudes about gender work roles and the harassment tradition. The organization's sexual harassment tradition is attributable to locally prevailing social norms. The spillover approach is also represented by the harasser's attitudes about gender work roles. The victim's work-role and sex-role are incongruent.

Depending on the parameterization of the individual, harasser, and organization, the mechanisms representing one or more of the above approaches will dominate the model's

behavior. For example, the mechanisms representing the organizational approach will dominate in the organization that tolerates sexual harassment.

Integrated from the system dynamics research were conformity (Richmond, unpublished); coping skills, stress, self esteem, and social credit (Goluke, 1981); and discrimination (Frohman, et al., 1978). Although the dynamics of these variables are from models of apparently dissimilar topics, phenomenologically they are quite similar.

Expansion

The system dynamics model of sexual harassment builds on the previous descriptive models (Tangri, et al., 1981, Gutek & Morasch, 1982) to include the harasser and the organization in which the harassment occurs. The harasser's influences on the sexual harassment system were hypothesized. Anger at being rebuffed, retribution against the victim, and the effects of the victim's coping skills on the incidence of sexual harassment were detailed. The role of organizational tradition and the effect of a discrepancy between tradition and present harassment tolerance were also examined.

As Richmond (unpublished) noted, systems models permit the explanation of individual differences by a generic structure that can reproduce and qualitatively forecast behaviors observed in the actual system. The individual, and in the sexual harassment model the harasser and

organization as well, is uniquely paramterized and simulated. For example, although most victims are female and most harassers are male, the model can explain harassment for victims and harassers, regardless of their gender. For these same reasons, the model is capable of describing harassment in a Fortune 500 company, a local grocery, and a university.

The use of system dynamics permitted the study of the interactions within the victim sector and between the victim, harasser, and organization sectors. Feedback linkages in the form of dynamic hypotheses were presented. The system dynamics approach permitted an expansion of the common mental models (e.g. those detailed by Tangri et al, 1981 and Gutek & Morasch, 1982) by increasing the rigor of those conceptualizations. As a result of the development of the system dynamics model of sexual harassment, greater insight into such constructs as anger, compliance, and organizational response to complaints was gained.

The effects of anger on actual retribution and the victim's fear of retribution was presented in detail. It became clear in various simulation runs that immediate anger could significantly affect the system. In a fit of anger at being rebuffed, the harasser might threaten the victim with reprisals for noncompliance, yet not actually consider retribution. The victim, not knowing the harasser's true intentions, remains fearful even after harassment and anger have decreased. The victim's fear of retribution

increases stress and the effects of stress on self esteem, job performance, and coping skills.

Additionally, two processes were hypothesized as means to reduce the level of anger. Anger may be slowly leaked out or quickly vented. Anger leakage is a fairly slow process, while anger venting is rather violent. It is the venting that has the greatest impact on the victim's fear of retribution. The harasser's ethics about retribution as an acceptable venting means determines how much of the vented anger will be released as retribution.

The dynamic model of sexual harassment permits an examination of an organization's response to deviant behavior. The organization's response to sexual harassment complaints was determined to be a function of the organization's tolerance of harassment, the severity of the harassment, the victim's and harasser's social credit values and their ratio, as well as the victim's coping skills. The parameterization of the effect of the victim's coping skills on organizational response is probably a function of several organizational and individual variables. The size of the organization, its attitudes about people filing complaints, beliefs about gender work-roles are examples of organizational factors that would moderate the victim's ability to force the organization to respond. Individual variables might include social support from friends, family and coworkers, and legal support from government agencies or civil rights groups.

Social credit, adapted from Goluke's alcoholism model (1980), influences the effectiveness of the victim's external coping skills and the organization's response to harassment. More encompassing than stature in the organization, social credit includes likability, perceived job performance, and the effects of halo. The more social credit the victim has, the more credible harassment complaints will be. Deviant behavior, such as a decrement in job performance or sexually harassing behavior, will be tolerated for longer periods of time when the individual possesses high levels of social credit. In addition, the victim's social credit relative to that of the harasser, is hypothesized to greatly influence the organization's response.

The effects of a lingering tradition of sexual harassment were also examined. Even though the organization no longer tolerated sexual harassment, the behavior norm appeared to be the major driving force. In the extreme example where the tolerance dropped from a very strong harassment tradition to one of intolerance, harassment did not necessarily decrease. In time, it is assumed that the new tolerance, if reinforced, would be accepted as the new organizational tradition.

The role of ethics and environmental factors that might force a compromise of principles were dynamically hypothesized. The harasser's ethics about retribution as a way to vent excess anger was described above. The

availability of other employment, the victim's need to keep the job, and fear of retribution were assumed to increase the victim's perceived vulnerability. The literature has indicated that the harasser also perceives some victims as vulnerable and directs harassment behavior at these individuals (e.g. Tangri, et al., 1981). All things being equal, perceived vulnerability should increase the victim's compliance. However, the victim's ethics about submitting to the harasser's demands will moderate this effect. Again, individual differences can be explained through a generic structure.

Finally, the relationship between stress and job performance was clarified. The ratio of stress and the victim's optimal stress better describes the stress/ performance relationship. Although optimal stress values may be similar for most people, the use of the ratio allows one to observe changes in performance for the individual under continual stress. Before the addition of optimal stress, the common inverted j-shaped curve (Scott, 1966) was static. In the model, it becomes clear that high stress will negatively affect self esteem and coping skills, and thereby further reduce job performance. This stress/optimal stress formulation also made it possible to explain the performance increase some harassment victims reported (Powell, et al., 1982).

Practical Contributions of the Model

As noted previously, simulation of the model suggested that no one policy will be effective over the long run in reducing and eliminating sexual harassment. Continued assurance to victims and harassers of the organization's stance must form the foundation of any harassment policy. Sexual harassment is a phenomenon based on long established socio-cultural values that are reflected by the organization and its members.

For changes in the organization's sexual harassment climate to be possible, a concerted effort must be made to convince both harassers and victims that the organization is sincere in its desire to stop sexual harassment. The expected time horizon is probably a function of the discrepancy between the harassment tradition and organizational tolerance of sexual harassment, individual coping skills, and external, environmental (e.g. legal) pressure.

Suggestions for Future Research

Systems Models of Sexual Harassment

In addition to the suggested direction of policy implementation, the system dynamics model establishes a framework to guide future sexual harassment research. Points of potential intervention have been identified, but the relative utility of policy options has not. While the dynamics of the victim sector are fairly complete, more research is needed in the harasser and organization sectors.

Because of the likely difficulty in obtaining a sufficient sample of sexual harassers, the most fruitful avenue of research would appear to lie with the organization.

Examination of the development and change of organizational traditions appears to offer great potential not only for the area of sexual harassment, but also for other topics of interest to organizations. Prejudice, poor work habits, and organizational climate in general, are all examples of organizational traditions. The dynamics of the harasser's social credit, the grievance experiences of previous harassment victims, and the effectiveness of various training and informational programs, might also prove useful in understanding the dynamics of the organization sector. The time horizon of such an examination is much longer than that of the model presented in this paper, however.

While this model of harassment focused on the individual victim within the organization, a systems model developed as an organizational tool would aggregate all victims and all harassers. In this instance, the problem of sexual harassment is redefined as an organizational problem, rather than as an individual problem that may affect the organization. Sexual harassment policies must be implemented on an organizational scale and, therefore, need to be examined on that level.

Empirical Examination of Sexual Harassment

Using systems models as framework, empirical studies would prove useful in the study of sexual harassment. For example, while the systems approach might indicate that behavioral training may be more effective than informational training in combatting harassment, it would be hard pressed to evaluate different behavioral training programs.

With respect to changes in organizational tradition, government agencies with politically appointed heads potentially offer a wealth of information. This empirical data might be very useful in building a systems model changing tradition. Empirical examination of various techniques designed to increase victims' awareness of sexual harassment rights, as well as employee relations programs, are also suggested as areas of research.

Concluding Remarks

The importance of previous family member system dynamics models to the development of the model of sexual harassment cannot be dismissed. Consistently, phenomena that at first appeared unrelated to the problem of sexual harassment proved to be driven by parallel mechanisms. Alcoholism, burnout, prejudice, sexual harassment, and conformity seem to share much of their structures and processes. Future systems analyses will want to explore other system family members. The areas of spouse abuse, rape, and motivation theory, in particular, appear to offer potential for systems research.

APPENDICES

APPENDIX A

INTRODUCTION TO SYSTEM DYNAMICS

Problem Identification and System Conceptualization

Understanding a dynamic problem requires that the problem be dynamically defined. Richardson and Pugh (1981) note that it is not necessary to use numerical data. Instead, system dynamics requires that the problem be defined as general qualitative trends over time. That is, "periods of increase and decrease, phase relationships among variables, peaks and valleys, and so on" (p. 19). One must also define the time horizon of the variables of interest. This may vary from a number of seconds or minutes in adrenalin secretion and depletion, to thousands of years for the formation of continents.

The definition of the problem is in part determined by the time frame selected (Richardson and Pugh, 1981). In continent formation, a single earthquake such as 1906 San Francisco quake would appear as a minor perturbation in a graph of continent movement. On the other hand, if the time frame were from 1900 to 2000, any quake of the 1906 magnitude would be a significant change. These differences in time perception change the researcher's focus. For example, the individual interested in earthquakes during the past one hundred years might choose to look at architectural integrity, population, feasibility of rescue operations and

so on. To the long range modeler, however, these variables would contribute little but unnecessary complexity to the model.

The time frame chosen for this model of sexual harassment is from one day to about two years. Although H. P. Curran (personal communication, January 11, 1984) noted that new hires are susceptible to sexual harassment, there is is little information as to how long most people suffer from harassment before they take action. Curran also observed that it takes time to perceive these sexual behaviors on the job as harassing. A woman with a feminist orientation would probably reach this conclusion sooner than someone with a more traditional outlook (Schneider, 1982).

Once that point is reached, however, the situation changes dramatically. If the victim is going to turnover, he or she will most likely do so within two weeks of this realization. If the victim choses to initiate some grievance procedures, the affair can last several years as it moves through the organizational hierarchy and the legal system (S. Bright, personal communication, December 2, 1983). Little research has been done concerning time and the accumulation of perceptions about social-sexual behaviors. For this reason, the two year figure may be rather confining, and the time horizon may need to be lengthened.

System boundaries defining what is to be included within the framework of the system must be determined for

the model. Concepts lying outside the hypothesized model are not included. For example, while world problems in Lebanon or Afghanistan are important, they have little bearing on sexual harassment; therefore, they will not be included in the model.

Richardson and Pugh (1981) point out that if everything were related to everything the modeler would be mired in a slough of interrelationships, preventing any real understanding of the problem. All variables that act upon and are themselves enacted are enclosed within the system boundaries.

Appropriate system boundaries are dependent on careful conceptualization of the problem (Forrester, 1968b). The system should contain as few components as possible to reproduce the reference mode. Mere presence of variable in a system is not justification for inclusion in a model. Only when omission of the variable causes changes in system behavior should that variable be included in the model. This is easily tested by "turning off" or assigning zero values for that variable. If there is no appreciable change in the system, the impact of that variable is minimal.

The system reference mode, describing the behavior of important variables over time, is developed at the beginning of the research and aids in dynamically defining the behavior of interest. For example, H. P. Curran (personal communication, January 11, 1984) noted that many harassment victims reported slight increases in performance

while being harassed. This was short-lived, however, and performance soon dropped. Reproduction of this phenomenon in the model increases the modeler's confidence that the model is accurately simulating the system. Also, system conceptualization is focused by the reference mode in that the behavior of different variables over time can be compared and linked.

Once the reference mode has been developed, the researcher is able to explore causal linkages and establish feedback loops. Feedback is typically depicted in either of two forms: the causal loop diagram or DYNAMO rate/level diagrams. Because of their simplicity, causal loop diagrams are useful in the initial stages of research. These are most often used in the early stages of conceptualization and when explaining system behavior to those not familiar with DYNAMO flow models (Richardson & Pugh, 1981). The flow models are more accurate representations of the system and form the basis of DYNAMO equations, the simulation language used in system dynamics. Although there are conceptual difficulties with causal loop diagrams (e.g. a decrease in one variable positively related to another will still cause the other variable to grow), most researchers begin with causal loop diagrams and then progress to a rate/level representation.

Causal loop diagrams show the nature of the relationships between variables. Linkages are labeled positive ("+") or negative ("-"). A positive sign means

that the variables move in the same direction. That is, an increase (decrease) in variable A leads to an increase (decrease) in variable B. A minus sign indicates that the variables are inversely related. An increase (decrease) in variable A leads to a decrease (increase) in variable B.

One must be careful when interpreting a positive relationship, however. As can be seen in Figure 35, more adults means more babies being born, over time further increasing the number of adults. A decrease in the number of babies being born does not decrease the number of adults. It merely slows the adult population growth rate. The signing of causal linkages can denote a proportional relationship or an accumulation of something. Care must be taken that the relationship is correctly understood. A loop containing an even number of negative signs is behaviorally different from one that has an odd number of negative links. The former is called a positive loop and continually reinforces itself as one traces around the loop. Its behavior is commonly termed a "snowball effect" or "vicious circle" because as the accumulation of the variable increases, the speed at which it grows also increases. This is the what occurs in world population growth models.

In Figure 35, the number of adults continues to climb even after people are stacked five deep across the entire planet. Of course this does not happen. Old adults die, food supplies run out, or in the case of the People's Republic of China, a one child per family policy is

instituted. Positive loops rarely go unchecked.

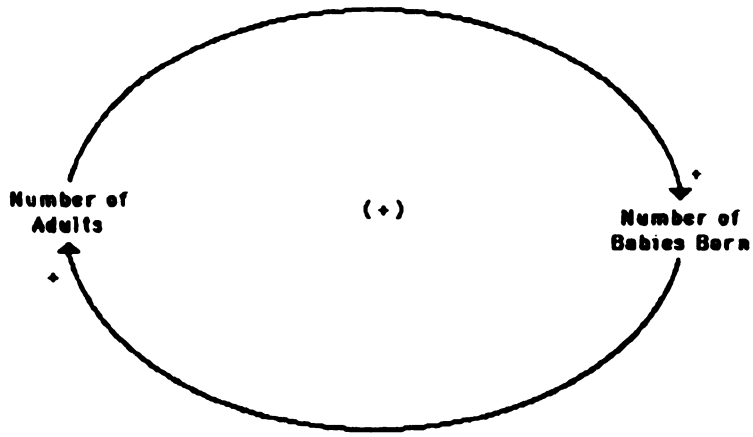

Figure 35. Causal loop diagram of a positive relationship.

Negative loops can be classified into two categories: goal-seeking or zero-seeking. The thermostat in Figure 36 would be an example of a goal-seeking system. When the temperature falls below the desired level, the furnace comes on to heat the room to the thermostat setting. When the room temperature is above that of the desired temperature, no action is taken.

The zero-goal negative loop, on the other hand, attempts to send the system to zero, muck like the drain in a sink. For example, when filled with water, a barrel with a bullet hole in the side is an example of a zero-goal system (see Figure 37). The more water in the barrel above the hole, the faster it will squirt out. With only a little water above the hole, the outflow will slow to a trickle. The goal of this system is to drain all the water above the hole. When no water remains above the hole the

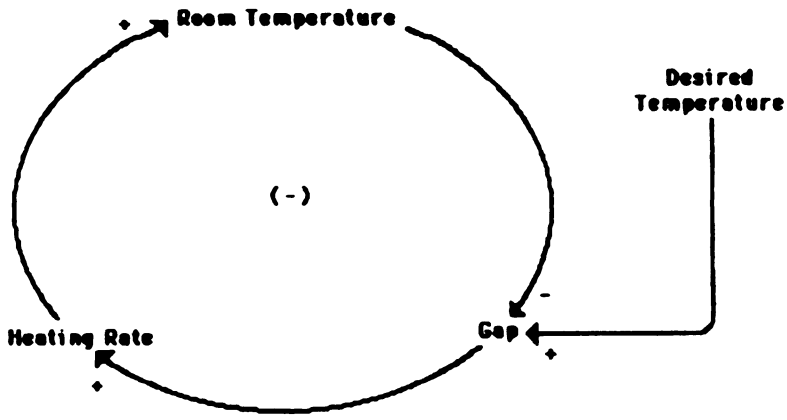

Figure 36. Causal loop diagram of a negative relationship.

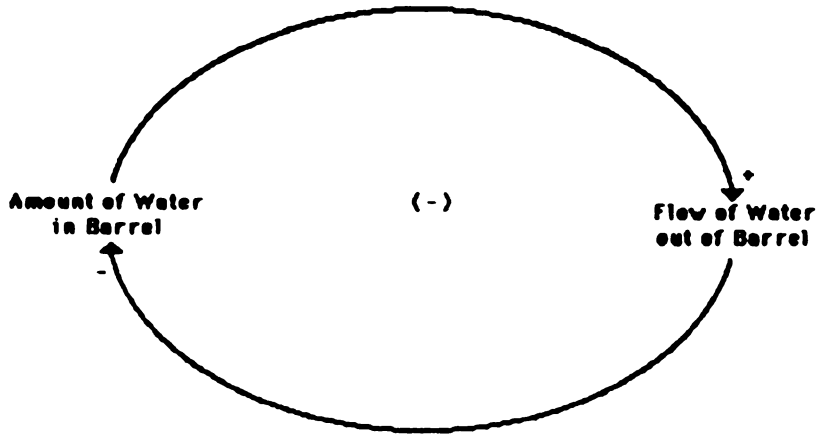

Figure 37. Squirting water.

leakage will stop.

At first glance, causal loops appear to simplify a system into an easily understandable representation. But as Morecroft (1982) observed, causal loop diagrams suffer from several weaknesses. Chief among them is the paucity of correspondence between mental models and the loop structure. Managers, he claims, view organizations as policy groupings corresponding to functional areas such as sales or personnel. The interconnectedness of these groupings is downplayed. It is important to understand the managers' perceptions of the organizational structure. From this conceptualization the feedback can be pieced together.

Causal loop diagrams can also be faulted for the lack of explicit representations of decision-making processes. A causal loop diagram does not permit the researcher to determine where policy decisions are made. As a result, the functional structure of the organization is often ignored. As an organizing tool, it lacks the distinction between material flows and information flows, about which more will be said later. Finally, the relationship between the causal loops and actual behavior is poor, making determination of loop polarity more difficult (Morecroft, 1982).

DYNAMO or rate/level flow diagrams solve many of these problems. Variables that accumulate, such as the overflowing bathtub, are called state variables or levels. Rates feed into and out of levels, determining the accumulation in the level over time. Figure 38 shows a

typical rate/level flow diagram. The nondescript masses acting as the source for the inflowing rate and the sink for the outgoing rate are called sources and sinks, respectively. In the inventory example discussed by Richardson and Pugh (1981), the source indicates where the inventory came from; the sink represents where the inventory goes. Where or what those sources and sinks are lies outside the boundary of the system. The rate at which material from the source flows into the level and from the level into the sink is determined by rate variables.

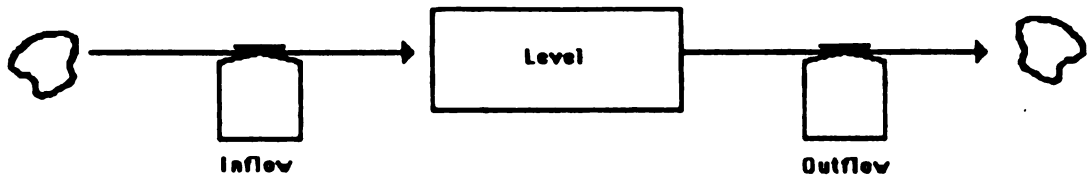

Figure 38. Typical rate/level flow diagram.

Material and information flows are easily represented in flow models. Material flows accumulate and are subject to scientific laws of conservation. Information feedback links differ significantly in this respect. It is the information links in a system dynamics model that comprise the model feedback. The causal loop diagram is deficient because it does not distinguish between the material flows and information links. Figures 39a and 39b compare a causal loop diagram with a rate/level representation. Both are simplifications of population growth and decline. Of course, there are other variables at work in the information

process. These are termed auxiliaries and will be discussed later.

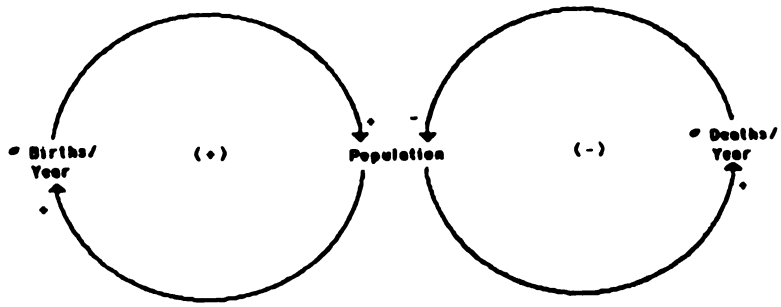

Figure 39a. Causal loop diagram of population growth and decline.

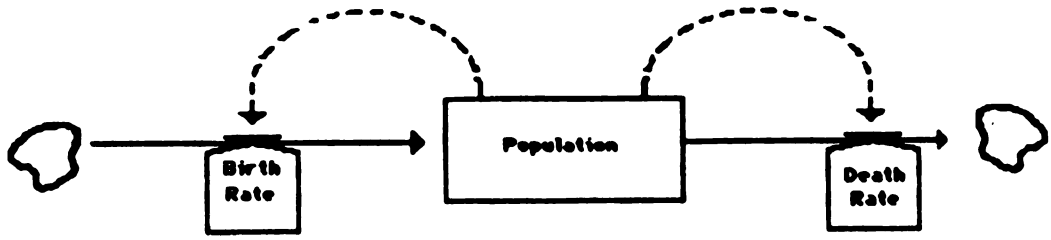

Figure 39b. Rate/level diagram of population growth and decline.

Introduction to DYNAMO

DYNAMO is the computer language used by many system dynamicists. The computer traces through a model over time, simulating the actual behavior of the system. Writing the computer simulation program is most easily accomplished using the structure of DYNAMO rate/level flow diagrams. DYNAMO uses constants and variables in deriving system behavior. Constants maintain their initial value throughout the course of the simulation. Variables, as their name suggests, vary as the system is simulated over time.

Levels, acting much like the bathtub and leaky barrel above, are variables that accumulate over time. The condition of the system is described in terms of level variables. The present level of a given variable is a function of the last measurement of the level and the amount of change in the level since it was last measured. Levels are accumulations of material or information flows. Information levels, such as perceptions and expectations, often accumulate slowly. The learning of prejudicial attitudes is one example. Unlike material flows, information flows are not conserved (Richardson & Pugh, 1981). That is, a source is not reduced when information is transmitted to other variables.

The accumulation or reduction of a level is determined by the rates of incoming and outgoing flows. These variables are simply called rates. Pictured as valves on either side of levels, rates often assume one of three forms: constants, a growth fraction multiplied by a level, or a level divided by the average lifetime of the variable of interest (Roberts et al., 1983). This last kind of rate is useful in representing outflow rates in systems such as decay of bridges and dissipation of toxic wastes in a landfill. The formulation of rate equations is more complicated and requires more care than that of levels.

The auxiliary is the third type of variable in DYNAMO diagrams and equations. Auxiliaries perform the algebraic functions sometimes needed in rate equations. While these

variables can be specified as constants, it is simpler to write them as auxiliary equations. Richardson and Pugh (1981) define auxiliary equations as "a computation representing information in a feedback system" (p. 81).

An auxiliary variable might be used if three different variables are algebraically combined. For example, if lower, middle, and upper income groups together determine population, then an auxiliary would be a convenient way to sum them. Of course, in other situations these levels might be combined using other algebraic functions.

TABLE functions are another example of an auxiliary variable. When a simple algebraic relationship is not adequate, a TABLE function can be used. If a nonlinear relationship is more accurate, the TABLE function can be used to describe the curve followed by the level variable. These specify a nonlinear relationship between variables. Figure 40 summarizes the types of variables present in a DYNAMO rate/level diagram and the symbols used to represent them.

The DELAY and SMOOTH functions are techniques used by system dynamicists to more accurately represent the system. If no delays are present in the model, DYNAMO will view it as a series of simultaneous equations, and the model will not run. This is not a problem, however, because delays are inherent in most systems. For example, in the lumber industry, there is a time delay between the time the trees are felled and a house is built. The number of level

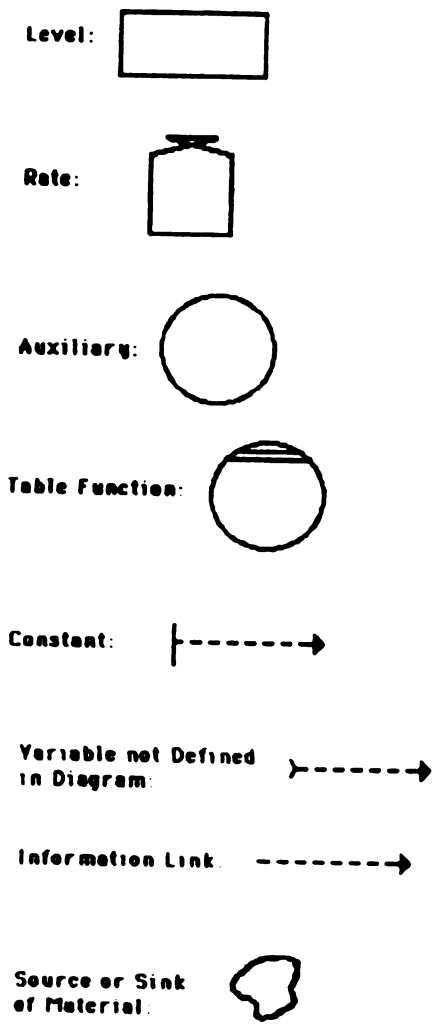

Figure 40. Symbols for flow diagrams (from Richardson & Pugh, 1981, p. 89).

variables contained in a DELAY determines the behavior of the levels. Figure 41 shows the behavior of various DELAYs in response to a sudden increase to the system. A first-order exponential delay has one level, a second-order exponential delay is comprised of two levels, and so on.

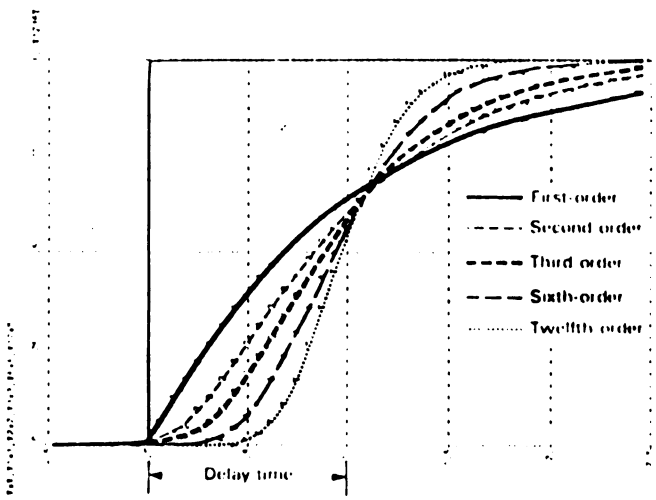

Figure 41. Behavior of first-, second-, third-, sixth-, and twelfth- order delays in response to a STEP increase (from Richardson & Pugh, 1981, p. 109.).

A SMOOTH function smooths out random behaviors occurring in a system over time. If one were interested in weight loss over a three month period, random hourly fluctuations would only serve to cloud the general trend of weight change. The SMOOTH averages the weight measurements to give the researcher an idea of the general weight loss trend. Because the SMOOTH is actually the averaging of a level over time, it could be represented as a level and a rate equation. The SMOOTH function provided by DYNAMO simplifies equation writing, and so is more commonly used.

The SMOOTH is also used in information delays.

Information is often delayed by the time for mailing, memo circulation, etc. Also, one cannot be aware of everything happening. The president of an auto manufacturer is not informed of sales on an hourly basis. Instead, sales information is usually presented for ten day periods. In this instance, the SMOOTH can be described as a first-order exponential information delay (Richardson and Pugh, 1981). Rates, levels and auxiliaries can be SMOOTHed when they act as information.

In addition to the SMOOTH and DELAY, DYNAMO also offers logical, test, and mathematical functions. The logical functions include MAX, MIN, CLIP, and SWITCH. The MAX function accepts the greater of two values, while the MIN function takes the lesser of two values. Other features of the MAX function include its ability to select absolute values and prevent division by zero. The CLIP and SWITCH functions allow changes in quantity values during the simulation. The CLIP, or FIFGE, function takes the First value IF the third is Greater than or Equal to the fourth. The SWITCH, or FIFZE, function takes the First value IF the third value is equal to ZEro. CLIP and SWITCH functions are normally used for policy testing purposes and are usually not seen as an integral part of the system feedback structure.

Test functions aid model and system understanding. These functions include STEP, PULSE, SIN and NOISE. The step function represents an abrupt change in the system:

There is no delay or smoothing. An inheritance is an example of a STEP function. When Great Aunt Hildy dies and wills her riches, the bank balance climbs abruptly. When graphed, a STEP function resembles a step from a staircase.

The PULSE function sends a sudden jolt to the model and then returns the system to its original level. When graphed, the RAMP function looks like a ramp, continuously increasing or decreasing. The SIN function tests the model's response to a sinusoidal variable. NOISE acts as random number generator inputting information into the model. Finally, there are mathematical functions such as square root, sine and cosine, exponents, and natural logarithms.

Determination of Parameters and Initial Values

Parameter Values

Before a model can be simulated, the parameters must be selected and initial values established. The determination of parameters is probably the most controversial aspect of the system dynamics approach (Richardson and Pugh, 1981). Many system dynamicists hold that dynamic models are, for the most part, unaffected by parameter changes, and that confidence levels like those used in regression are too restrictive (Richardson & Pugh, 1981). In short, these modelers maintain that model behavior is a function of model structure and not its parameter values. These concepts can be unsettling to those well versed in statistical models

(Richardson & Pugh, 1981).

Parameters need only be estimated to the degree that they suit the purposes of the modeler. In most instances, models are developed as an aid in policy analysis. "If the policy implications of a model do not change when its parameters are varied, ... then from the modeler's point of view the parameters do not need to be estimated any more accurately than that" (Richardson & Pugh, 1981, p. 231). Of course, model simulation is necessary to determine if parameter changes do make a difference. But because parameter values are needed to simulate a model, the modeler chooses values he or she considers reasonable. If more accurate estimation is needed, the modeler can easily go back and change the parameter values. Richardson and Pugh (1981) summarize the parameter estimation issue by stating that "if it doesn't make any difference, then it really doesn't make any difference" (p. 231).

Ideally, selected parameter values should be observable, but often this is not possible; then the modeler must intuit the parameter values. The parameter metric should reflect the actual system under study. System parameters are usually estimated from one of three data sources: information about overall system behavior, information about the relationships between individual variables, and, finally, firsthand knowledge of the process (Richardson & Pugh, 1981).

Measurement parameters such as average income or

housing costs are fairly easy to obtain. They are straightforward and are hardly controversial. At the other end of the scale lies parameters representing adjustment times. These can represent perception delays, formation of attitudes, and other psychological variables. Determining the values for these parameters is much more difficult, requiring careful thought about the length of time to acquire information, process it, and realize behavior change.

It is still possible, however, to establish the upper and lower bounds of parameters even without data (Richardson and Pugh, 1981). For example, in their model of burnout, Levine et al. (unpublished) found that people in the service industries usually enter their jobs fresh and are ready to take on the world. With time many begin suffering from burnout. If people are going to burn out they will probably do so within X years. It would also seem unlikely that these people would begin displaying symptoms of burnout during their first few months on the job.

It would seem reasonable then to establish lower and upper parameter bounds at three months and five years. The initial parameter for burnout would lie between three months and five years, with two years as a reasonable estimate. Richardson and Pugh (1981) termed values chosen in this fashion a "shot in the twilight" (p. 234). It is a logically derived initial parameter value that can easily be changed later if more is learned about the phenomenon of

burnout. Again, it is important to stress that in a system dynamics model it is the structure of the variables that is important, not their parameter values. The behavior of the system is a function of this model structure.

One can also use statistical methods for estimating parameters in dynamic models. Unfortunately, the traditional correlational and multiple regression procedures are lacking in several areas (Richardson and Pugh, 1981). Although the existence of relationships between variables can be inferred by correlational techniques, causality cannot. Even with additional information suggesting causality, the polarity of relationships may be clouded by correlation coefficients. This phenomenon usually occurs in the context of negative feedback loops where one or more variables are omitted in the computation of the correlation coefficient. Multiple regression formulations to estimate parameterS may suffer from similar deficiencies.

In estimating parameters statistically, the system dynamicist attempts to emulate the physical scientist. For example, to understand the function of resistors, the researcher attaches an ohmmeter and derives an independent measure of resistance. It is not necessary to measure the current within the system over time. Similarly, a researcher interested in demolition rates for inner city buildings could ask demolition experts or city managers. Of course there may be some error in their estimates, but this error will most likely have little impact on model behavior.

Initial Values of Levels

In specifying the initial values for levels, the modeler must decide which of three general situations is best suited to the model's purpose: replicating history, starting the model at an equilibrium point, or specifying the model for some growth (or decline) pattern. Each of these poses difficulties.

Occasionally, the researcher designs the model to replicate past data. Initial values would then be determined by the values of the levels at the point in history at which the simulation begins. An archeologist or historical anthropologist might choose this method for selecting initial values.

The second situation is when the the system is specified to begin at some equilibrium point. At this point of stability the rates flowing into a level equals the rates flowing out. For a system to be stable this must be true of each level in the model. This approach is often used to test system response to disturbances. Initializing values for equilibrium can be quite difficult, however, especially in models containing more than one level variable or levels with more than one outflow or inflow (Richardson & Pugh, 1981). As a last resort, one can simulate the system until it reaches equilibrium, and then use those values as initial values for the levels.

In the final situation the researcher initializes the model for some particular behavior pattern such as growth or

collapse. Examples of this latter situation include the dynamics of personnel management and of companies in fast growth industries like computer software (Richardson & Pugh, 1981). Formulating growth or decline patterns can be very difficult. An understanding of the model structure can aid formulation of level initial values.

Sensitivity

In order to make decisions and implement policies based on information from model analyses, system dynamicists must be aware of the sensitivity of their models. That is, to what degree will model behavior change when different assumptions are incorporated into model structure. Also, the researcher is interested in model behavior given various parameter and initial level values.

Model sensitivity can be classified in three different ways: numerical, behavioral, and policy sensitivity (Richardson & Pugh, 1981). A model displays numerical sensitivity when numerical values computed during the simulation are changed under different parameters or structure. Numerical sensitivity is characteristic of all quantitative models. Parameter or structural alternatives that produce changes in model behavior are said to exhibit behavioral sensitivity. As stated above, system dynamics models are fairly resistant to the effects of parameter changes. It is the structure of model feedback, rates, and levels that determine model behavior. The numerical values of variables will change, but model behavior, as depicted in

graphs over time, will remain fundamentally the same.

Policy sensitivity is the greatest concern of the modeler. A model that is so sensitive to reasonably varying parameter values that it cannot evaluate the worth of different policies is feckless as a policy tool. If parameter values do appear to alter model behavior, the modeler must determine if, in fact, the parameter reflects the actual system or is an artifact of the model formulation. To test whether the system is represented, one could ask experienced people if those results appear reasonable. They can be "walked" through the model and asked to comment on model assumptions. Should the sensitivity be due to an artifact of the model, the model must be reformulated to remove it.

If the model is insensitive to varying parameter values, then the parameter values have been estimated with sufficient accuracy. If policy analyses hold up to varying parameter values, the model is satisfactory as a tool for policy evaluation. Having achieved policy insensitivity to changing parameter values, numerical and behavioral sensitivity do not really matter (Richardson & Pugh, 1981).

Even though evidence does exist that model behavior is not affected by varying parameter values, system dynamicists' claims of model insensitivity are not without detractors (Richardson & Pugh, 1981). When the system of interest can be described as a pattern of dynamic interactions, then general trends are sufficient for policy

analysis.

System dynamics models tend to be affected by structural changes moreso than parameter changes for two main reasons. First, in a complex system different loops may dominate at different points in time. When a city is decaying, for example, migration out of the city would dominate the population model (See Figure 42). If a new factory opens, the loop representing migration into the city would dominate. A change in a nondominant loop will have little overall impact on model behavior. A change in a dominant loop may have some impact until other loops begin to take over.

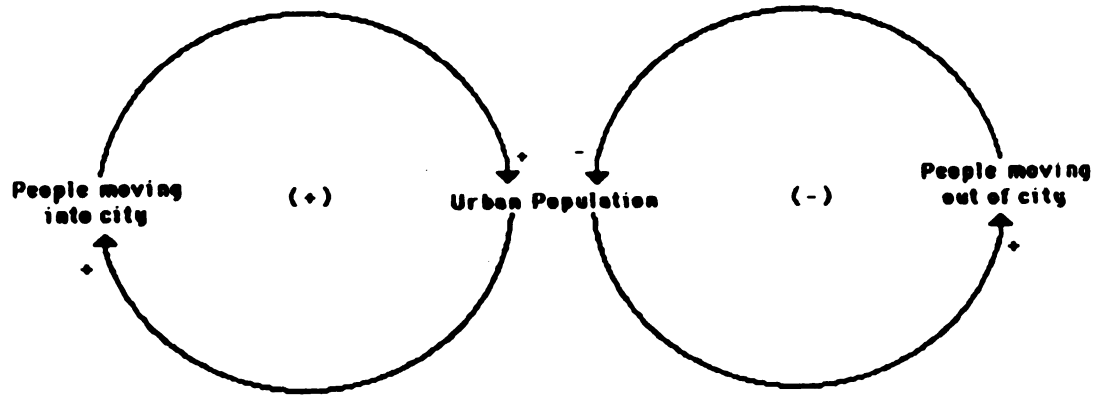

Figure 42. Model of urban population growth and decline.

Compensatory feedback loops are the second factor affecting the sensitivity of system dynamics models. Although a parameter change may affect the strength of one feedback loop, the rest of the of the feedback loops in the

model will react accordingly and compensate for the resulting weakness or strength in the changed loop. The behavior of the model is minimally affected by these changes. Richardson and Pugh (1981) observe feedback systems in engineering were developed with this in mind. The cruise control in an automobile is expected to maintain a specified speed even when faced with a change in road level or wind conditions. The system compensates for these parameter changes. In social systems similar safeguards that resist change are present (Richardson & Pugh, 1981). A model representing this kind of system should represent these feedback mechanisms.

In those models where a parameter change does affect model behavior, the modeler has three options for dealing with the situation. First, the modeler learns that care must be exercised in determining that particular parameter value. The range of parameter values that the system (not the model) deems appropriate must be determined. Another option is to reformulate the model so that it more closely represents the actual system. This may involve more detailing of the feedback structure of the system. This response assumes that the sensitivity is associated with the model; not with the system itself. Better depiction of the system acts to desensitize an overly sensitive model. The third response is to view the model's sensitivity as a fulcrum in the system above which system intervention is possible.

APPENDIX B

DYNAMO EQUATION LISTING

In this technical appendix, the flow diagrams presented in Chapter IV are translated into DYNAMO equations. These equations are entered into the computer to simulate the sexual harassment system. Equations for the victim, harasser, and organization sectors are listed and detailed. The formulation of stress, coping skills, social credit, and self esteem is heavily based on Goluke's (1980) alcoholism model. The model, as listed below, represents the sexual harassment system at equilibrium. For ease of reading, line numbers and NOTEs have been omitted.

A Dynamic Theory of Sexual Harassment

The Victim

Victim Stimulation, Stimulation Norm, and Stress

Victim's stimulation.

```
L S.K=S.J+(DT)(SAVR.JK-SAR.JK-SLR.JK)
N S=SI
C SI=3
    S:      stimulation
    SAVR:   stimulation arrival rate
    SAR:    stimulation adjustment rate
    SLR:    stimulation leakage rate
    SI:     stimulation initial value
R SLR.KL=S.K*FSL.K
C FSL=.2
    SLR:    stimulation leakage rate
    S:      stimulation
    FSL:    fractional change in stimulation leakage
C RSAVR=.6
    RSAVR:  reference stimulation arrival rate
R SAVR.KL=RSAVR+TINPUT.K+ESHS.K+EFRETS.K
```

```
    SAVR:    stimulation arrival rate
    RSAVR:   reference stimulation arrival rate
    TINPUT:  test input of stimulation
    ESHS:    effect of sexual harassment on stimulation
    EFRETS:  effect of fear of retribution on
             stimulation
A TINPUT.K=STEP(HGHT,STRT)
C HGHT=0
C STRT=0
    TINPUT:  test input of stimulation
    HGHT:    height of step function
    STRT:    starting point of step function
A ESHS.K=MULT*SH.K
C MULT=1
    ESHS:    effect of sexual harassment on
             stimulation
    MULT:    sexual harassment multiplier
    SH:      sexual harassment
A EFRETS.K=TABHL(EFREST,FRET.K,0,2,.4)
T EFREST=.000001/.05/.1/.2/.4/.8
    EFRETS:  effect of retribution on stimulation
    EFREST:  EFRETS table function
    FRET:    fear of harasser's retribution
R SAR.KL=(S.K-SN.K)*FCSAR.K
    SAR:     stimulation adjustment rate
    S:       stimulation
    SN:      stimulation norm
    FCSAR:   fractional change in stimulation adjustment
             rate
A FCSAR.K=UAIC.K*EAIC.K*FCASA
C FCASA=.5
    FCSAR:   fractional change in stimulation adjustment
             rate
    UAIC:    utilization of available internal coping
             skills
    FCASA:   fraction of internal coping skills
             available for stimulation adjustment
    EAIC:    effectively available internal coping
             skills
```

Victim's stimulation norm.

```
L SN.K=SN.K+(DT)(SNCR.JK)
N SN=SNI
C SNI=3
    SN:      stimulation norm
    SNCR:    stimulation norm change rate
    SNI:     stimulation norm initial value
R SNCR.KL=(S.K-SN.K)*PFCSN.K
    SNCR:    stimulation norm change rate
    S:       stimulation
    SN:      stimulation norm
    PFCSN:   potential fractional change in stimulation
             norm
A PFCSN.K=UAIC.K*EAIC.K*FCASNA.K
```

```
    PFCSN:  potential fractional change in stimulation
            norm
    UAIC:   utilization of available internal coping
            skills
    FCASNA: fraction of internal coping skills
            available for stimulation norm adjustment
    EAIC:   effectively available internal coping
            skills
A UAIC.K=TABHL(UAICT,STR.K,0,4,.5)
T UAICT=.8/.95/1/.9/.7/.4/.2/.1/0
    UAIC:   utilization of available internal coping
            skills
    UAICT:  UAIC table function
    STR:    stress ratio (STRESS.K/OSTRESS.K)
A FCASNA.K=1-FCASA.K
    FCASNA: fraction of internal coping skills
            available for stimulation adjustment
    FCASA:  fraction of internal coping skills
            available for stimulation norm adjustment
A SR.K=LOGN(S.K/SN.K)
    SR:     stimulation ratio
    S:      stimulation
    SN:     stimulation norm
A CSSR.K=TABHL(CSSRT,SR.K,-.8,.8,.1)
T CSSRT=2.3/2.15/2/1.75/1.15/.6/.3/.1/0/.1/.3/.6/1.15
    /1.75/2/2.15/2.3
    CSSR:   contribution to stress from the stimulation
            ratio
    CSSRT:  CSSR table function
    SR:     stimulation ratio
L PS.K=PS.J+(DT/TPSC)(S.J-PS.J)
N PS=SI
C TPSC=1
    PS:     past stimulation
    TPSC:   time to perceive stimulation change
    S:      stimulation
    SI:     stimulation initial value
L PSN.K=PSN.J+(DT/TPSNC)(SN.J-PSN.J)
N PSN=SN
    PSN:    past stimulation norm
    TPSNC:  time to perceive stimulation norm change
    SN:     stimulation norm
```

Victim's stress and the stress ratio.

```
A STRESS.K=CSSR.K+CSFCS.K+CSFCSN.K
    STRESS: stress
    CSSR:   contribution to stress from stimulation
            ratio
    CSFCS:  contribution to stress from fractional
            change in stimulation
    CSFCSN: contribution to stress from fractional
            change in stimulation norm
A CSFCS.K=TABHL(CSFCST,FCS.K,-.25,.25,.0625)
T CSFCST=2/.8/.4/0/0/0/.4/.8/2
```

```
        CSFCS:  contribution to stress from fractional
                change in stimulation
        CSFCST: CSFCS table function
        FCS:    fractional change in stimulation
A CSFCSN.K=TABHL(CSFSNT,FCSN.K,-.25,.25,.0625)
T CSFSNT=2/.8/.4/0/0/0/.4/.8/2
        CSFCSN: contribution to stress from fractional
                change in stimulation norm
        CSFSNT: CSFCSN table function
A FCS.K=(S.K-PS.K)/(PS.K*TPSC)
        FCS:    fractional change in stimulation
        S:      stimulation
        PS:     past stimulation
        TPSC:   time to perceive stimulation change
A FCSN.K=(SN.K-PSN.K)/(PSN.K*TPSNC)
C TPSNC=1
        FCSN:   fractional  change in stimulation norm
        SN:     stimulation norm
        PSN:    past stimulation norm
A STR.K=STRESS.K/OSTRESS.K
        STR:    stress ratio
        STRESS: stress
        OSTRESS: optimal stress
A OSTRESS.K=ROST*ESEOS.K
C ROST=.25
        OSTRESS: optimal stress
        ROST:   reference optimal stress
        ESEOS:  effect of self esteem on optimal stress
        EEXTCO: effect of external coping skills on optimal
```

Optimal stress is primarily determined by self esteem. Extremely low levels of coping skills will also lower optimal stress. However, an individual with such low levels of coping skills are unlikely to be able perform their jobs.

```
A ESEOS.K=TABHL(ESEOST,SE.K,0,1,.25)
T ESEOST=.8/.95/1/1.05/1.075
        ESEOS:  effect of self esteem on optimal stress
        ESEOST: ESEOS table function
        SE:     self esteem
```

Victim's Self Esteem

Self esteem is determined by external and internal cues. To the extent that one attends to external cues or internal cues is defined by individual's field dependence Someone with high field dependence has all his or her self

esteem determined by the external environment. Likewise, low field dependence means the person only attends to internal cues. An amplification multiplier on SEDV and SEDG accounts for this. The amplification value can range from 0 (low field dependence) to 5 (high field dependence). A highly field dependent individual will realize greater fluctuations in self esteem as environmental cues change. The multiplier speeds up self esteem development and degradation for the field dependent person.

```
L SE.K=SE.K+(DT)(SEDV.JK-SEDG.JK)
N SE=SEI
C SEI=.5
    SE:     self esteem
    SEDV:   self esteem development rate
    SEDG:   self esteem development rate
    SEI:    self esteem initial value
R SEDV.KL=SE.K*FCSE*ESEDV.K*AF
C FCSE=.05
C AF=2.5
    SEDV:   self esteem development rate
    SE:     self esteem
    FCSE:   fractional change in internal self esteem
    ESEDV:  effect of self esteem on its development
A ESEDV.K=TABHL(ESEVT,UBSE-SE,0,.3,.05)
T ESEDVT=0/0/.4/.7/.9/.97/1
C UBSE=1
    ESEDV:  effect of self esteem on its development
    ESEVT:  ESEDV table function
    UBSE:   upper bound of self esteem
    SE:     self esteem
R SEDG.KL=SE.K*FCSE.K*ESEDG.K*AF*ESHSE.K
    SEDG:   self esteem degradation rate
    SE:     self esteem
    FCSE:   fractional change in self esteem
    ESEDG:  effect of self esteem on its degradation
    AF:     amplification factor
    ESHSE:  effect of sexual harassment on self esteem
A ESEDG.K=TABHL(ESEDGT,SE.K-LBSE,0,.3,.05)
T ESEDGT=0/0/.4/.7/.9/.97/1
C LBSE=0
    ESEDG:  effect of self esteem on its
            degradation
    ESEGT:  ESEDG table function
    SE:     self esteem
    LBSE:   lower bound of self esteem
```

Victim's Coping Skills

Victim's internal coping skills.

```
L INTC.K=INTC.J+(DT)(INTCDV.JK-INTCDG.JK)
N INTC=INTCI
C INTCI=1.25
    INTC:   internal coping skills
    INTCDV: internal coping skill development
    INTCDG: internal coping skill degradation
R INTCDV.KL=INTC.K*FCICDV.K
    INTCDV: internal coping skill development
    INTC:   internal coping skills
    FCICDV: fractional change in internal coping due to
            coping skill development
A FCICDV.K=RFCICV*ESTRIV.K
C RFCICV=.01
    FCICDV: fractional change in internal coping skill
            development
    RFCICV: reference fractional change in coping skill
            development
    ESTRIV: effect of stress ratio on internal coping
            skill development
     The reference value is equal to 1%/week indicating
     that coping skills change slowly relative to
     stimulation flow.
A ESTRIV.K=TABHL(ESTIVT,STR.K,0,4,.5)
T ESTIVT=.75/4/5/4.5/3.5/1.5/.75/.25/0
    ESTRIV: effect of stress ratio on internal coping
            skill development
    ESTIVT: ESTRIV table function
    STR:    stress ratio
R INTCDG.KL=INTC.K*FCICDG.K
    INTCDG: internal coping skill degradation rate
    INTC:   internal coping skills
    FCICDG: fractional change in internal coping skills
            due to coping skill degradation
A FCICDG.K=RFCICG*ESTRIG.K
C RFCICG=.01
    FCICDG: fractional change in internal coping skills
            due to coping skill degradation
    RFCICG: reference fractional change in internal
            coping skill degradation
    ESTRIG: effect of stress ratio on internal coping
            skill degradation
A ESTRIG.K=TABHL(ESTIGT,STR.K,0,5,.5)
T ESTIGT=.75/.7/.5/.6/.8/1/1.4/2/2.7/3.8/5
    ESTRIG: effect of stress ratio on coping skill
            degeneration
    ESTIGT: ESTRIG table function
    STR:    stress ratio
A EAIC.K=INTC.K*ESEIC.K
    EAIC:   effectively available internal coping
```

```
                skills
        INTC:   internal coping skills
        ESEIC:  effect of self esteem on effectively
                available internal coping skills
    A ESEIC.K=TABHL(ESEICT,SE.K,.1,.5,.1)
    T ESEICT=.1/.5/.75/.95/1
        ESEIC:  effect of self esteem on effectively
                available internal coping skills
        ESEICT: ESEIC table function
        SE:     self esteem
```

External coping skills.

```
    L EXTC.K=EXTC.J+(DT)(EXTCDV.JK-EXTCDG.JK)
    N EXTC=EXTCI
    C EXTCI=1.25
        EXTC:   external coping skills
        EXTCDV: external coping skill development
        EXTCDG: external coping skill degradation
        EXTCI:  initial value for external coping skills
    R EXTCDV.KL=EXTC.K$EINTCV.K$FCECDV.K$EOTCDV.K$AF2
    C AF2=5
        EXTCDV: external coping skill development rate
        EXTC:   external coping skills
        EINTVC: effect of internal coping skills on
                external coping skill development
        FCECDV: fractional change in external coping skill
                development
        EOTCDV: effect of organizational tolerance of
                harassment on external coping skill
                development
        AF2:    amplification factor for external coping
                skills
```

Internal coping skills are considered because an individual unable to cope internally will have decreased ability to develop external coping skills. An amplification factor is used to speed up external coping skill development and degradation, much like that used in external self esteem.

```
    A EINTCV.K=TABHL(EINTVT,INTC.K,0,.4,.1)
    T EINTVT=0/.25/.5/.90/1
        EINTCV: effect of internal coping skills on
                external coping skill development
        EINTVT: EINTCV table function
        INTC:   internal coping skills
    A FDECDV.K=ESTREV.K$RFCECV
    C RFCECV=.01
        FCECDV: fractional change in external coping skill
```

```
                development
        ESTREV: effect of stress ratio on external coping
                skill development
        RFCECV: reference fractional change in external
                coping skill development
    A ESTREV.K=TABHL(ESTEVT,STR.K,0,4,.5)
    T ESTEVT=.75/4/5/4.5/3.5/1.5/.75/.25/0
        ESTREV: effect of stress ratio on external coping
                skill development
        ESTEVT: ESTECV table function
        STR:    stress ratio (stress/optimal stress)
    A EOTCDV.K=TABHL(EOTCVT,ORGTOL,0,1,.25)
    T EOTCVT=1.15/1.0625/1/.5/.1
        EOTCDV: effect of organization tolerance on
                external coping skill development
        EOTCVT: EOTCDV table function
        ORGTOL: organizational tolerance of sexual
                harassment
```

The less tolerant the organization, the more credence it will give to harassment complaints, establish sexual harassment grievance procedures, and make available information about sexual harassment (i.e. pamphlets, training programs, etc.).

```
    R EXTCDG.KL=EXTC.K*FCECDG.K*AF2
        EXTCDG: external coping skill degradation rate
        EXTC:   external coping skill
        FCECDG: fractional change in external coping skills
                due to coping skill degradation
        AF2:    external coping skill amplification factor
    A FCECDG.K=RFCECG*ESTREG.K
    C RFCECG=.01
        FCECDG: fractional change in external coping skills
                due to coping skill degradation
        RFCECG: reference fractional change in external
                coping skill degradation
        ESTREG: effect of stress ratio on external coping
                skill degradation
    A ESTREG.K=TABHL(ESTEGT,STR.K,0,5,.5)
    T ESTEGT=.75/.7/.5/.6/.8/1/1.4/2/2.7/3.8/5
        ESTREG: effect of stress ratio on external coping
                skill degeneration
        ESTEGT: ESTREG table function
        STR:    stress ratio

    Effectively available external coping skills.
    A EAEC.K=EOTEC.K*ESCEC.K*EXTC.K*ESSUPC.K*EINTCE.K
        EAEC:   effectively available external coping
                skills
```

```
        EOTEC:  effect of organizational tolerance of
                sexual harassment on effectively available
                external coping skills
        ESCEC:  effect of victim social credit on effect-
                ively available external coping skills
        EXTC:   external coping skills
        ESSUPC: effect of social support on effectively
                available external coping skills
        EINTCE: effect of internal coping skills on
                effectively available external
                coping skills
    A EOTEC.K=TABHL(EOTECT,ORGTOL,0,1,.2)
    T EOTECT=1.075/1.025/1/.6/.3
        EOTEC:  effect of organizational tolerance of
                harassment on effectively available
                external coping skills
        EOTECT: EOTEC table function
        SORGT:  SMOOTHed organizational tolerance of
                harassment
    A ESCEC.K=TABHL(ESCECT,SC.K,0,1,.25)
    T ESCECT=.2/.5/.99/1/1.025
        ESCEC:  effect of victim social credit on
                effectively available external coping
                skills
        ESCECT: ESCEC table function
        SC:     victim social credit
    A ESSUPC.K=TABHL(ESSPCT,SSUP.K,0,1.5,.3)
    T ESSPCT=.125/.25/.75/.95/.99/1
        ESSUPC: effect of social support on effectively
                available external coping skills
        ESSPCT: ESSUPC table function
        SSUP:   social support
    A EINTCE.K=TABHL(EINTET,INTC.K,0,.6,.15)
    T EINTET=0/.125/.25/.65/1
        EINTCE: effect of internal coping skills on
                effectively available external coping
                skills
        EINTET: EINTCE table function
        INTC:   internal coping skills
        Some minimal level of internal coping skills are
        necessary to use external coping skills.
```

Victim's Social Credit

```
    L SC.K=SC.J+(DT)(SCDV.JK-SCDG.JK)
    N SC=SCI
    C SCI=.5
        SC:     social credit
        SCDV:   social credit development rate
        SCDV:   social credit degeneration rate
        SCI:    social credit initial value
    R SCDV.KL=SC.K*ESCDV.K*FISC.K*EPPSCV.K
        SCDV:   social credit development rate
        SC:     social credit level
```

```
     ESCDV:  effect of social credit on its development
     FISC:   fractional increase in social credit
     EPPSCV: effect of perceived victim performance on
             social credit development
A ESCDV.K=TABHL(ESCDVT,UBSC-SC.K,0,.3,.05)
T ESCDVT=0/0/.4/.7/.9/.97/1
C UBSC=1
     ESCDV:  effect of social credit on its development
     ESCDVT: ESCDV table function
     UBSC:   social credit upper bound
     SC:     social credit
A FISC.K=TABHL(FISCT,STR.K,0,2,.25)
T FISCT=0/.04/.07/.09/.1/.09/.07/.04/0
     FISC:   fractional increase in social credit
     FISCT:  FISC table function
     STR:    stress ratio (stress/optimal stress)
A EPPSCV.K=TABHL(PPSCVT,PPERF.K,.25,1,.25)
T PPSCVT=.25/.5/.85/1
     EPPSCV: effect of perceived job performance on
             social credit development
     PPSCVT: EPPSCV table function
     PPERF:  perceived job performance
R SCDG.KL=SC.K*ESCDG.K*FDSC.K*ERETSC.K*EPOTCG.K
          *EPPSCG.K
     SCDG:   social credit degeneration rate
     SC:     social credit
     ESCDG:  effect of social credit on its degeneration
     ERETSC: effect of retribution on social credit
     FDSC:   fractional decrease in degeneration rate
     EPOTCG: effect of potential problems on degradation
             of victim's social credit
     EPPSCG: effect of perceived performance on social
             credit degeneration
A ESCDG.K=TABHL(ESCDGT,SC.K-LBSC,0,.3,.05)
T ESCDGT=0/0/.4/.7/.9/.97/1
C LBSC=0
     ESCDG:  effect of social credit on its degeneration
     ESCDGT: ESCDG table function
     SC:     social credit
     LBSC:   social credit lower bound
A FDSC.K=TABHL(FDSCT,STR.K,2,10,2)
T FDSCT=0/.015/.04/.065/.1
     FDSC:   fractional decrease in social credit
     FDSCT:  FDSC table function
     ORGTOL: organizational tolerance of harassment
             behaviors
     STR:    stress ratio (stress/optimal stress)
A ERETSC.K=TABHL(ERETST,RET.K,0.2.5,.5)
T ERETST=1/1.05/1.12/1.25/1.5/1.9
     ERETSC: effect of retribution on social credit
             degeneration
     ERETST: ERETSC table function
     RET:    retribution against victim
```

At first glance it may appear that these equations are unnecessary; that the effect of perceived performance on social credit would encompass the effects of retribution. But the harasser may talk about the victim to other workers and superiors and in general attempt to influence other's views.

```
A EPOTCG.K=TABHL(EPOTGT,PPROB.K,0,3,1)
T EPOTGT=1/1/1.01/1.05
    EPOTCG: effect of potential problems on social
            credit degeneration
    EPOTGT: EPOTCG table function
    PPROB:  potential problems for victim
A EPPSCG.K=TABHL(PPSCGT,PPERF.K,0,1,.25)
T PPSCGT=1.2/1.1/1.05/1.025/1
    EPPSCG: effect of perceived performance on social
            credit degeneration
    PPSCGT: EPPSCG table function
    PPERF:  perceived job performance
A PPROB.K=CPPOT.K*CPEAEC.K+CPPSC.K
    PPROB:  potential problems for the victim
    CPPOT:  contribution to potential problems by
            organizational tolerance of harassment
    CPEAEC: contribution to potential problems by
            effectively available external coping
            skills
    CPPSC:  contribution to potential problems by
            social credit
```

An individual with excellent coping skills and low social credit in an organization that tolerates harassment can expect a negative reaction from the organization. This will be represented as a decrease in social credit (SC). Coping skills can become a problem when the organization does not tolerate them.

```
A CPPOT.K=TABHL(CPPOTT,ORGTOL.K,0,1,.2)
T CPPOTT=0/.5/.85/1/1.15/1.2
    CPPOT:  contribution to potential problems by
            ORGTOL
    CPPOTT: CPPOT table function
    ORGTOL: organizational tolerance of sexual
            harassment
A CPPSC.K=TABHL(CPPSCT,SC.K,0,1,.2)
```

```
T CPPSCT=1.5/1/0/-.7/-1.1
    CPPSC:  contribution to potential problems by
            social credit
    CPPSCT: CPPSC table function
    SC:     victim social credit
A CPEAEC.K=TABHL(CPEAET,EAEC.K,0,2.7,.9)
T CPEAET=0/.85/1.4/1.75
    CPEAEC: contribution to potential problems by EAEC
    CPEAET: CPEAEC table function
    EAEC:   effectively available coping skills.
```

Victim's Compliance with Harasser's Demands

Victim's perceived vulnerability.

```
A VUL.K=EEACV.K+EJALTV.K+EFRETV.K
    VUL:    victim's vulnerability
    ESCRV:  effect of social credit ratio on
            vulnerability
    EEACV:  effect of effectively available coping
            skills on vulnerability
    EJALTV: effect of job alternatives on vulnerability
    EFRETV: effect of fear of retribution on
            vulnerability
A AVVUL.K=SMOOTH(VUL.K,TAVVUL.K)
N AVVUL=AVVULI
C AVVULI=0
    AVVUL:  averaged vulnerability
    VUL:    victim's perceived vulnerability to
            retribution
    TAVVUL: time to average vulnerability
    AVVULI: AVVUL initial value
A TAVVUL.K=TABHL(TAVULT,SE.K,0,1,.2)
T TAVULT=1/1.5/3/5/8/12
    TAVVUL: time to average vulnerability
    TAVULT: TAVVUL table function
    SE:     victim's self esteem
A EEACV.K=TABHL(EEACVT,EAEC.K,0,2,.25)
T EEACVT=1.5/1.4/1.25/1/.95/.75/.5/.1/.05
    EEACV:  effect of effectively available coping
            skills on
            vulnerability
    EEACVT: EEACV table function
    EAEC:   effectively available external coping
            skills
A EJALTV.K=TABHL(EJALTT,JALT,0,1,.2)
T EJALTT=1.1/.8/.3/.1/.05
C JALT=.25
    EJALTV: effect of perceived job alternatives on
            victim's perceived vulnerability
    JALT:   job alternatives (0=no jobs,1=many jobs)
            Someone with no job alternatives is more
            vulnerable to retribution from harasser.
A EFRETV.K=TABHL(EFRETT,FRET.K,0,2,.4)
T EFRETT=.0001/.25/.5/1/1.15/1.25
```

```
        EFRETV: effect of fear of retribution on
                vulnerability
        EFRETT: EFRETV table function
        FRET:   fear of retribution
    A FRET.K=ESCRFR.K*EANGFR.K
        FRET:   fear of retribution
        ESCRFR: effect of SMOOTHed social credit ratio on
                FRET
        EANGFR: effect of anger on fear of retribution
    A ESCRFR.K=TABHL(ESCRFT,SSCR.K,0,2.5,.5)
    T ESCRFT=1.5/1.1/1/.9/.5/0
        ESCRFR: effect of SMOOTHed social credit ratio on
                victim's fear of retribution
        ESCRFT: ESCRFR table function
        SSCR:   SMOOTHed social credit ratio
    A EANGFR.K=TABHL(EANGFT,ANGER.K,0,3.2,.8)
    T EANGFT=0/1/1.25/1.5/2
        EANGFR: effect of Anger on fear of retribution
        EANGFR: EANGFR table function
        ANGER:  anger
```

SMOOTHed anger is not used here. The victim will fear retribution based on the anger the harasser displays at the time of the sexual harassment and noncompliance. Even the harasser may not intend to carry out any threats made in the heat of anger, the victim may believe that the threats will be followed through.

Victim's compliance with harassment.

```
    A COM.K=RVULC.K*ESHCOM.K*REFWIL
    C REFWIL=.75
        COM:    compliance with harasser's demands
        RVULC:  relationship between perceived
                vulnerability and compliance
                with harassers demands
        ESHCOM: effect of sexual harassment on compliance
        REFWIL: reference value for victim's willingness to
                comply
    A RVULC.K=TABHL(RVULCT,VUL.K,0,1,.2)
    T RVULCT=0/.5/1/1.25/1.5/1.6
        RVULC:  relationship between perceived
                vulnerability and compliance
                with harassers demands
        RVULCT: RVULC table function
        VUL:    victim's vulnerability to harasser's
                retribution
    A ESHCOM.K=TABHL(ESHCMT,SH.K,0,1,.2)
    T ESHCMT=1/.975/.85/.6/.3/.15
        ESHRC:  effect of sexual harassment ratio on
```

```
            compliance
      ESHRCT: ESHRC table function
      SHR:    sexual harassment ratio
      SH:     sexual harassment
```

Victim's Job Performance

Perceived job performance.

```
L PPERF.K=PPERF.J+(DT)(PPERFV.JK-PPERF.JK)
N PPERF=PPERFI
C PPERFI=1
    PPERF:  perceived job performance
    PPERFV: perceived performance development rate
    PPERFG: perceived performance degradation rate
    PPERFI: perceived performance initial value
R PPERFV.KL=SRPERF.K*ECOMPV.K*EPPERI.K*ESCPV.K*FCPPV
C FCPPV=.05
        PPERFV: perceived performance development rate
    SRPERF: SMOOTHed job performance
    ECOMPV: effect of compliance on perceived
            performance development rate
    EPPERI: effect of perceived performance on its
            increase
    ESCPV:  effect of social credit on perceived
            performance development rate
    FCPPV:  fractional change in perceived performance
            development rate
A ECOMPV.K=SWITCH(ECOMCI,ECOMSU.K,HAR)
C ECOMCI=1
C HAR=0
    ECOMPV: effect of compliance on perceived
            performance development rate
    ECOMCI: effect of complying with coworker harasser
            on perceived performance development rate
    ECOMSU: effect of complying with superior harasser
            on perceived performance development rate
    HAR:    harasser (0=superior,1=coworker)
            A victim harassed by a supervisor may
            receive improved performance evaluations.
            A victim harassed by a coworker may be
            viewed negatively by superiors.
A ECOMSU.K=CLIP(POSEPP.K,COMSH.K,NEGEPP.K,CLIPNO)
A NEGEPP.K=NEGEP
C NEGEP=1
C CLIPNO=-.44
    ECOMSU: effect of complying with superior harasser
            on perceived performance development rate
    POSEPP: short term positive effects on perceived
            performance
    NEGEPP: negative effects on perceived performance
    NEGEP:  negative effects constant
    COMSH:  compliance with severe harassment
    CLIPNO: natural log value SH and COM
A POSEPP.K=TABHL(POSPPT,COMSH.K,-.6,0,.2)
```

```
T POSPPT=1/1.05/1.075/1.1
    POSEPP: short term positive effects of complying
            with harasser
    POSPPT: POSEPP table function
    COMSH:  compliance with severe harassment
            Compliance with harasser's demands are not
            likely to affect the harasser's perceptions
            of the victim's job performance, but
            evaluations of her performance may reflect
            rewards for compliance.
A EPPERI.K=TABHL(EPPRIT,UBPP-PPERF.K,0,.3,.05)
T EPPRIT=0/0/.4/.7/.9/.97/1
C UBPP=2
    EPPERI: effect of perceived performance on its
            increase
    EPPRIT: EPPERI table function
    UBPP:   upper bound of perceived performance
    PPERF:  perceived performance
A ESCPV.K=TABHL(ESCPVT,SC.K,.5,1,.1)
T ESCPVT=1/1.01/1.05/1.1/1.2/1.25
    ESCPV:  effect of social credit on perceived
            performance development
    ESCPVT: ESCPV table function
    SC:     victim's social credit
    Basically, the effects of social credit on
    perceived performance development and degradation
    account for halo.
R PPERFG.KL=ECOMPG.K*EPPERD.K*ERETPP.K*SRPERF.K*ESCPG.K
            *FCPPG
C FCPPG=.05
    PPERFG: perceived performance degradation rate
    ECOMPG: effect of compliance on perceived
            performance degradation rate
    EPPERD: effect of perceived performance on its
            decrease
    ERETPP: effect of retribution on perceived
            performance
    SRPERF: SMOOTHed relative job performance
    ESCPG:  effect of social credit on perceived
            performance degradation rate
A ECOMPG.K=SWITCH(ECOMCG.K,ECOMSG,HAR)
C ECOMSG=1
    ECOMPG: effect of compliance on perceived
            performance degradation rate
    ECOMCG: effect of complying with coworker
    ECOMSG: effect of complying with superior
    HAR:    harasser (coworker or superior)
A ECOMCG.K=TABHL(ECOMCT,COMSH.K,-1.5,0,.5)
T ECOMCT=1/1.05/1.075/1.1
    ECOMCG: effect of compliance with coworker on
            perceived performance degradation rate
    ECOMCT: ECOMCG table function
    COMSH:  compliance with severe harassment
A EPPERD.K=TABHL(EPPRIT,PPERF-LBPP,0,.3,.05)
```

```
C LBPP=0
    EPPERD: effect of perceived performance on its
            decrease
    EPPRIT: EPPERD table function
    PPERF:  perceived performance
    LBPP:   lower bound of perceived performance
A ERETPP.K=TABHL(ERETPT,RET.K,0,2.5,.5)
T ERETPT=1/1.05/1.1/1.25/1.5/1.75
    ERETPP: effect of retribution on perceived
            performance
    ERETPT: ERETPP table function
    RET:    harasser retribution against victim
    2.5 was chosen as the ceiling because ANGER levels
    of 4 (very high) and a potential for retribution =
    1 yields a RET value of 2.25.  Although RET can
    assume values above 2.5, behaviors at this level
    could probably be classified as criminal.
A ESCPG.K=TABHL(ESCPGT,SC.K,0,.5,1)
T ESCPGT=1.25/1.2/1.1/1.05/1.01/1
    ESCPG:  effect of social credit on perceived
            performance degradation
    ESCPGT: ESCPG table function
    SC:     victim's social credit
A COMSH.K=LOGN(COM.K*SH.K)
    COMSH:  compliance with severe harassment
    COM:    compliance with harassment
    SH:     sexual harassment
```

It was necessary to combine sexual harassment and compliance. Compliance with a dirty joke is much different than compliance with demands for sexual favors. The effects of compliance depend on the severity of the harassment.

Job performance.

```
A SRPERF.K=SMOOTH(RELPER.K,RELPAT.K)
N SRPERF=PPERFI
    SRPERF: SMOOTHed relative job performance
    RELPER: relative job performance
    RELPAT: averaging time for relative performance
A RELPER.K=PERF.K/PERFN
C PERFN=1
    RELPER: relative job performance
    PERF:   job performance
    PERFN:  normal performance of the individual
    A relative performance norm greater than one
    indicates the individual is working harder than
    coworkers.
A RELPAT.K=TABHL(RELPTT,SC.K,0,1,.25)
T RELPTT=.5/1.5/2/3/4  (weeks)
    SRPERF: smoothed relative job performance
    RELPER: relative job performance (perf/norm)
```

RELPAT: relative job perf averaging time
RELPTT: RELPAT table function
SC: victim social credit

Victim job performance is SMOOTHed somewhat so that a small lapse is tolerated (e.g. a small problem at home). If this problem continues, however, or if the victim suffers from low social credit, this time lag may be shortened to almost nothing (i.e. a welcome opportunity to be rid of the individual). Similarly, for the individual with high social credit and perhaps tenure, the social credit may reduce punishment to a simple reprimand or being farmed out to some job until retirement. Legal pressures or other environmental constraints could affect this process, however. If harassment is a major concern due to lawsuits, even slight transgressions may be of great concern to the organization. With environmental factors ruled out, a low social credit victim may be ignored, giving her the simple option of quitting. In this situation, her effectively available coping skills become important.

In short, a victim with high levels of social credit can suffer a lapse of job performance that lasts longer without the organization lowering social credit. A victim with no social credit may last two or three days before low social consequences elicits an organizational response.

1. Social credit has an effect on the time to perceive changes in performance changes. High social credit will slow the time to perceive changes or at least to increase the time period before the organization will respond.

2. Perceived performance will be affected by social credit. The more social credit, the better the perceived performance will be.

Therefore, social credit will influence not only the time to perceive changes in job performance, but also the actual level of perceived job performance.

```
A PERF.K=REFPER*ESTRP.K
C REFPER=1.43
    PERF:   job performance
    ESTRP:  effect of stress ratio on performance
    REFPER: reference job performance
    REFPER=1.43 and STR=0 yields a performance value = 1
A ESTRP.K=TABHL(ESTRPT,STR.K,.25,2,.25)
T ESTRPT=.7/.9/.99/1/.97/.7/.4/.2
    ESTRP:  effect of the stress ratio on job performance
    ESTRPT: ESTRP table function
    STR:    stress ratio (stress/optimal stress)
```

Curran (H. P. Curran, personal communication, January 11, 1984) noted that at the onset of harassment incidents, the victim often responds by increasing work efforts. The dynamics are explained below.

--Stress ratio is a function of stress and optimal stress.

--As stress approaches optimal stress performance increases. Higher levels of stress lead to decreased job performance.

--Optimal stress is function of the reference optimal stress, and the effects of self esteem. And, as the stress ratio climbs, self esteem decreases, lowering optimal stress and increasing the stress ratio. These effects of self esteem quicken the decline of job performance.

Victim's Social Support

Social support can be disaggregated into coworker support and external support. Coworker support is probably a function of victim social credit. This is not the same social credit mentioned above. This is social credit with other workers, while the other is social credit with the organization. In same cases, they will be similar, in others dramatically different. As stated earlier, women often believe sexual harassment victims initiated and enjoyed being harassed. Attitudes toward and attributions about the harassment victim are partly determined by the general feminism of coworkers and to a lesser degree, the harassment and grievance experiences of others.

```
A SSUP.K=COFR*(FEM+HEXPO)+OTHFR.K*(EXTSUP)
C COFR=.6
C FEM=.5
C HEXPO=.8
A OTHFR.K=1-COFR
C EXTSUP=1
```

SSUP: social support
COFR: fraction of social support that is coworker support
FEM: feminist attitudes held by women in work unit (0-1)
HEXPO: harassment experiences of others (0-1, 1 = every female in work unit has been a victim)
OTHFR: fraction of social support from outside sources
EXTSUP: social support external to the organization

The Harasser

Harasser's Anger and Retribution Against Victim

Anger growth.

```
L ANGREG.K=ANGREG.J+(DT)(ANGRO.JK-ANDEG.JK)
N ANGREG=ANGERI
C ANGERI=0
```

ANGREG: harasser's anger
ANGRO: anger growth rate

```
        ANDEG:  anger degradation rate
    A ANGER.K=ANGREG.K*HGONE.K
        ANGER:  harasser's anger moderated by OR
        ANGREG: harasser's anger
        HGONE:  harasser gone -- fired
    A HGONE.K=CLIP(0,1,SOR.K,ORC)
    C ORC=.5
        HGONE:  harasser gone -- fired
        SOR:    SMOOTHed organizational response
        ORC:    organizational response constant
```

This mechanism is used to remove the effects of the harasser after termination due to harassment not tolerated by the organization. Once SOR surpasses ORC, HGONE is equal to zero. For SOR values < than ORC, ANGER is equal to ANGREG.

```
    R ANGRO.KL=EHPTA.K+ECOMAG.K+EORA.K+EANGRO.K
        ANGRO:  anger growth rate
        EHPTA:  effect of harasser's perception of threat
                on anger growth
        ECOMAG: effect of victim's compliance on anger
                growth
        EORA:   effect of organizational response to sexual
                harassment on harasser anger
        EANGRO: effect of anger on its growth
    A EHPTA.K=TABHL(EHPTAT,AVHPT.K,0,2,.4)
    T EHPTAT=0/.24/.5/.8/.99/1.15
        EHPTA:  effect of harasser's perception of threat
                on anger growth
        EHPTAT: EHPTA table function
        AVHPT:  SMOOTHed harasser's perception of threat
    A ECOMAG.K=TABHL(ECOMAT,NCOMSH.K,-3,0,.6)
    T ECOMAT=.00001/.25/.5/.8/.99/1.15
        ECOMAG: effect of compliance on anger growth
        ECOMAT: ECOMAG table function
        NCOMSH: noncompliance with severe sexual harassment
    A EORA.K=TABHL(EORAT,OR.K,0,2,.4)
    T EORAT=0/.3/.6/.9/1.15/1.25
        EORA:   effect of organizational response to sexual
                harassment on harasser's anger
        EORAT:  EORA table function
        OR:     organizational response to sexual
                harassment
    A EANGRO.K=TABHL(EANGRT,ANGER.K,1.5,4.5,1)
    T EANGRT=0/.4/.8/1.15
        EANGRO: effect of anger on its growth
        EANGRT: EANGRO table function
        ANGER:  harasser's anger
    A NCOMSH.K=LOGN(NCOM.K*SH.K)
```

```
A NCOM.K=1-COM.K
    NCOMSH: noncompliance with severe harassment
    NCOM:   noncompliance with sexual harassment
    SH:     sexual harassment
    COM:    compliance with sexual harassment

    Anger degradation.
R ANGDEG.KL=EADL.K+VENTA.K
    ANGDEG: anger degradation rate (via leakage &
            venting)
    EADL:   effect of anger on its degradation via
            leakage
    VENTA:  venting of anger (active)
```

The leakage of anger is a dissipative process that is more passive than the venting. VENTA, on the other hand, is a more explosive process. In short, given enough time people simply forget about their anger. But if anger builds to a great enough level, it must be vented by yelling, taking it out on family, and sometimes by getting even with the harassment victim. The former have been lumped together, while the retribution aspect of the ventilation has been set aside because of its relevance to the problem of sexual harassment.

```
A EADL.K=FLANG*ANGER.K
C FLANG=.1
    EADL:   effect of anger on its degradation via
            leakage
    FLANG:  fractional leakage of anger
    ANGER:  anger
A VENTA.K=ANGER.K*VENTPO.K*FVANG
C FVANG=.6
    VENTA:  venting of anger
    ANGER:  harasser's anger
    VENTPO: venting potential
    FVANG:  fraction of anger vented
A VENTPO.K=PVAVR.K+PVAVO.K
    VENTPO: venting potential
    PVAVR:  potential to vent anger via retribution
    PVAVO:  potential to vent anger via other means
```

The more angry one is, the more anger will be vented in one fashion or another (e.g. retribution). High levels of

anger will be vented more than lower levels. A slow buildup in anger will accumulate to a threshold point at which it will burst. This simulates seething.

```
A PVAVR.K=RETETH
C RETETH=.5
    PVAVR:  potential to vent anger via retribution
    RETETH: retribution ethics (1 = anger vented via
            retribution, 0 = anger vented other ways)
A PVAVO.K=1-PVAVR.K
    PVAVO:  potential to vent anger in ways other than
            retribution
    PVAVR:  potential venting of anger via retribution
```

Harasser's retribution against victim.

```
A RET.K=(ANGER.K*PVAVR.K+CRAZED.K)*EORRET.K
    RET:    harasser's retribution against the victim
    ANGER:  harasser's anger
    PVAVR:  potential to vent anger via retribution
    CRAZED: retribution by harasser crazed with anger
A CRAZED.K=CLIP(REV.K,0,SMANG.K,3)
    CRAZED: crazed anger that ignores ethics and fear
            of punishment
    REV:    revenge desired by crazed harasser
    SMANG:  SMOOTHed anger
```

This CLIP function says that for an individual crazed with anger, ethics and fear of punishment are pushed aside. More formally, the CRAZED takes the value of the table function REV if SMANG is greater than three. Otherwise, CRAZED assumes a value of zero.

```
A EORRET.K=TABHL(EORRT,OR.K,.5,.8,.1)
T EORRT=1/.5/.25/.0001
    EORRET: effect of organizational response on
            retribution
    EORRT:  EORRET table function
    OR:     organizational response to sexual
            harassment
A REV.K=TABHL(REVT,SMANG.K,3,5,.5)
T REVT=.2/.5/.75/.9/1
    REV:    revenge desired by crazed harasser
    REVT:   REV table function
    SMANG:  SMOOTHed anger
    The ceiling on retribution is 3.25 = 2.25 (from
    anger * potential anger) + 1 (from CRAZED)
A SMANG.K=SMOOTH(ANGER.K,TSMANG)
```

```
N SMANGI=ANGERI
C TSMANG=2  (weeks)
    SMANG:  SMOOTHed anger
    ANGER:  anger
    TSMANG: time to SMOOTH anger
    SMANGI: SMANG initial value
    ANGERI: ANGER initial value
```

Harasser's Perception of Threat

```
A HPT.K=ECOMPT.K*EOTHPT.K
    HPT:    harasser's perception of threat
    ECOMPT: effect of compliance on harasser's
            perception of threat
    EOTHPT: effect of organizational tolerance of
            sexual harassment on harasser perception of
            threat
A ECOMPT.K=TABHL(ECOMTT,NCOMSH.K,-3,0,.6)
T ECOMPT=0/.75/1/1.2/1.4/1.5
    ECOMPT: effect of compliance on harasser perception
            of threat
    ECOMTT: ECOMPT table function
    NCOMSH: noncompliance with severe harassment
A EOTHPT.K=TABHL(EOTHTT,ORGTOL,0,1,.2)
T EOTHTT=1.3/1.1/1.05/.95/.5/.25
    EOTHPT: effect of ORGTOL on harasser perception of
            threat
    EOTHTT: EOTHPT table function
    ORGTOL: organization's tolerance of sexual
            harassment
A AVHPT.K=SMOOTH(HPT.K,TAHPT.K)
N AVHPT=AVHPTI
C AVHPTI=0
    AVHPT:  SMOOTHED harasser perception of threat
    HPT:    harasser perception of threat
    TAHPT:  time to SMOOTH harasser perception of
            threat
A TAHPT.K=TABHL(TAHPTT,HSC,0,1,.2)
T TAHPTT=1/1.5/3/5/8/12
    TAHPT:  time to SMOOTH harasser's perception of
            threat
    TAHPTT: TAHPT table function
    HSC:    harasser's social credit
```

Sexual Harassment

```
A SH.K=HTRAD*EASH.K*EHPTSH.K*EORSH.K*EHASH.K*OPPOR
  *EAECSH.K
    SH:     sexual harassment
    HTRAD:  harassment tradition
    EASH:   effect of anger on sexual harassment
    EHPTSH: effect of harasser's perception of threat
            on sexual harassment
    EORSH:  effect of organizational response to sexual
```

```
                harassment on sexual harassment behavior
        EHASH:  effect of harasser's attitudes about
                women's work roles on sexual harassment
        OPPOR:  opportunity for harassment (no. of women
                available for harassment, victim's marital
                status, nature of job, sex-roles, etc. It
                ranges from 0 to 1, although will most
                always be equal to 1.)
        EAECSH: effect of effectively available external
                coping skills on sexual harassment
    A EASH.K=TABHL(EASHT,ANGER.K,1,2.5,.5)
    T EASHT=1/1.02/1.05/1.1
        EASH:   effect of anger on sexual harassment
        EASHT:  EASH table function
        ANGER:  harasser's anger
    A EHPTSH.K=TABHL(EHPTST,AVHPT.K,0,2,.4)
    T EHPTHT=1/1.025/1.05/1.1/1.15/1.2
        EHPTSH: effect of harasser's perception of threat
                on sexual harassment
        EHPTST: EHPTSH table function
        AVHPT:  SMOOTHed harassers perception of threat
```

The harasser is not likely to initiate harassment if he is fearful of punishment. However, once harassment has occurred he may pursue further harassment to make the victim feel guilty and therefore less likely to tell others about the harassment. This TABLE function does not consider this. However, the effect of anger on harassment does take into account anger resulting from fear of punishment, embarrassment, etc.

```
    A EORSH.K=TABHL(EORSHT,OR.K,0,.6,.15)
    T EORSHT=1/.95/.5/.25/.000001
        EORSH:  effect of organizational response to
                sexual harassment
        EORSHT: EORSH table function
        OR:     organization's response to sexual
                harassment
    A EHASH.K=TABHL(EHASHT,HAWWR,-1,1,.4)
    T EHASHT=1.6/1.2/1.1/.9/.4/.00001
        EHASH:  effect of harasser's attitudes about
                women's work roles on sexual harassment
        EHASHT: EHASH table function
        HAWWR:  harasser's attitudes about women's work
                roles
    C OPPOR=1
        OPPOR:  opportunity for harassment (no. of women
```

available for harassment, victim's marital status, nature of job, sex-roles, etc.)

```
A EAECSH.K=TABHL(EAECHT,EAEC.K,0,2,.4)
T EAECHT=1/.99/.95/.5/.45/.4
    EAECSH: effect of effectively available external
            coping skills on sexual harassment
    EAECHT: EAECSH table function
    EAEC:   effectively available external coping
            skills
```

Harasser's Attitudes about Gender Work Roles

Attitudes about women's work roles will be a constant for the purposes of this model. It us unlikely that attitudes would change in the short time horizon of the model. The more positive a person's attitude about women in the work place, the more likely that individual is to perceive women's attitudes about sexual harassment, and not harass in the first place. HAWWR may assume values between -1 and 1.

```
C HAWWR=1
    HAWWR:  harasser attitudes about gender work roles
```

Harasser's Social Credit

```
C HSC=.75
    HSC:    harasser's social credit (0-1)
```

The Organization

Organizational Tolerance of Sexual Harassment

```
C HTRAD=.5
C ORGTOL=.5
    ORGTOL: organizational tolerance of sexual
            harassment
    HTRAD:  organization's sexual harassment tradition
    High ORGTOL (i.e. ~1) indicates the organization
    tolerates or even encourages harassment. An
    organization with low tolerance of harassment is
    active in trying to stop it.
```

It is important to understand the distinction between harassment tradition and organization's tolerance of

harassing behavior. The harassment tradition is a phenomenon that evolves over a long period of time. It is a tradition. Organizational tolerance will reflect this tradition until some external forces or empowered individuals within the organization force a change. Otherwise the status quo is maintained.

Organizational Response to Sexual Harassment

A OR.K=(EOTOR.K*ESCOR.K*EHSCOR.K*ESCROR.K*EAECR.K *SSH.K)+FIRED.K

OR: organization's response to complaints of harassment
EOTOR: effect of organization's tolerance on organizational response to harassment
ESCOR: effect of victim social credit on organization's response
EHSCOR: effect of harasser social credit on organizational response to sexual harassment
ESCROR: effect of social credit ratio on organizational response.
EAECR: effect of victim's effectively available external coping skills on organizational response to sexual harassment
SSH: SMOOTHed sexual harassment
FIRED: harasser is fired

Both the actual levels of victim and harasser social credit as well as their relative value (i.e. social credit ratio) are considered in the organization's response to sexual harassment. High status harassers and victims will evoke a different response than those with low social credit. The ratio considers the relationship between the harasser and his or her victim. FIRED shuts down harassment when the organizational response to sexual harassment reaches ORC. This is necessary to prevent the harasser from "laying low" until the climate is such that harassment is

again possible.

```
A FIRED.K=CLIP(5,0,SOR.K,ORC)
     FIRED:  harasser is fired when FIRED = 5
     SOR:    SMOOTHed organizational response to sexual
             harassment
     ORC:    organizational response constant
A EOTOR.K=TABHL(EOTORT,ORGTOL,0,1,.2)
T EOTORT=2/1.4/1/.8/.4/.0001
    EOTOR:  effect of organization's harassment
            tolerance on organizational response
            to harassment
    EOTORT: EOTOR table function
    ORGTOL: organization's tolerance of sexual
            harassment
A ESCOR.K=TABHL(ESCORT,SC.K,0,1,.2)
T ESCORT=.1/.25/.6/.95/1.05/1.1
    ESCOR:  effect of victim's social credit on org.
            response
    ESCORT: ESCOR table function
    SC:     victim social credit
A EHSCOR.K=TABHL(ESCORT,HSC,0,1,.2)
    EHSCOR: effect of harasser social credit on org.
            response
    ESCORT: EHSCOR table function
    HSC:    harasser's social credit
```

It is likely that even with the same organizational status, a female victim will have less credibility with the organization than her male harasser. Social credit takes this into account. By virtue of being female, this victim would be awarded a lower level of social credit than her male harasser.

```
A ESCROR.K=TABHL(ESRORT,SCR.K,0,2,.4)
T ESRORT=.0001/.5/.925/1.075/1.15/1.2
    ESCROR: effect of the social credit ratio on
            organizational response
    ESRORT: ESCROR table function
    SCR:    ratio between social credit of victim
            and harasser
    The higher the harasser's social credit relative to
    the victim's, the less the organization will
    respond to sexual harassment charges.
A SCR.K=SC.K/HSC
    SCR:    social credit ratio
    SC:     victim social credit
    HSC:    harasser social credit
```

Curran (H. P. Curran, personal communication, January 11, 1984) noted that coworkers may have some extra power because of old boy networks and so on. For this reason, even with a social credit ratio of one (victim and harasser have the same social credit) there is still a threat of retribution if the victim doesn't possess the necessary coping skills. Past this point, however, harassment may still occur, but the victim is less vulnerable to retribution.

```
A EAECOR.K=TABHL(EAECRT,EAEC.K,0,3,.6)
T EAECRT=0/.5/1/1.25/1.5/1.6
    EAECOR: effect of effectively available external
            coping skills on organizational response
    EAECRT: EAECR table function
    EAEC:   victim's effectively available external
            coping skills
    SCR:    social credit ratio (victim/harasser)
A SSH.K=SMOOTH(SH.K,SHAT.K)
A SHAT.K=TABHL(SHATT,HSC,0,1,.2)
T SHATT=.5/1/1.5/3/5/8
N SSH=SSHI
C SSHI=0
    SSH:    SMOOTHed sexual harassment
    SH.K    sexual harassment
    SHAT:   sexual harassment averaging time
    HSC:    harasser's social credit
    SSHI:   SSH initial value
```

Output Statements

```
PRINT SH/PERF/PPERF/S,SN/STR/STRESS
PRINT S,SN/STR/STRESS
PRINY INTC,EXTC,EAEC,EAIC
PRINT ANGER,HPT,RET,OR
PRINT COM/SE/SC/FRET
PLOT SH/PERF,PPERF
PLOT S,SN/STR/STRESS
PLOT INTC,EXTC,EAEC,EAIC
PLOT ANGER/RET/HPT/OR
PLOT COM/SE/SC/FRET
SPEC DT=.1/PRTPER=5/PLTPER=1/LENGTH=26
RUN
```

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