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Systemic Creation of Organizational Anxiety:
An Empirical Study

John J. Voyer, Janet M. Gould, and David N. Ford

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John Voyer, School of Business, University of Southern Maine
Janet Gould, Center for Organizational Learning, Massachusetts
Institute of Technology
David Ford, Institutt for Informasjonsvitenskap, Universitetet i
Bergen, Norway

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Abstract

Inquiry into a product development organization in the semiconductor industry revealed a high level of organizational anxiety. Using causal loop diagramming in conjunction with qualitative data analysis, inside members of a research team created a map of the organization's cognitive schema (or collective mental model) from data obtained from informants in the organization. The map showed how the organization's use of classic defense mechanisms to control organizational anxiety instead created feedback loops that amplified it. Suggestions for controlling anxiety systemically are offered.

Many people experience anxiety, an intense feeling of apprehension and fear, in circumstances where these emotions are warranted, such as acute physical danger. But since the dawn of psychology and psychotherapy, psychoanalytic scholars have suggested that anxiety, at an unconscious level, is virtually endemic to the human condition. For example, late in his career Freud (1920) focused on the notion that people engage in an elemental internal struggle between instincts of life and death. Using this idea as a springboard, Klein (1948) suggested that the young child's struggle between life and the unease associated with death leads to something she called "persecutory anxiety."

More recently, psychoanalytically-oriented organizational researchers have proposed that individual anxiety has an organizational analogue, and have suggested some reasons for its existence (Diamond, 1991; Hirschhorn, 1988; Hirschhorn & Young, 1991; Kets de Vries & Associates, 1991; Kets de Vries & Miller, 1984). Hirschhorn and Young (1991) and Diamond (1991) suggest that a struggle, very similar to the one in individuals, takes place in work groups and organizations. Although organizations do not suffer death in the same way that individuals do, they do face the possibility that their financial or operational viability (the analogue to being alive) will end. Organizations face the possibility of ceasing to exist (the analogue to death) through bankruptcy, takeover, mergers, and so on. Scholars propose that organizations engage in struggles between continued existence and demise, in a process similar to the one described above for

individuals. The result is organizational persecutory anxiety (Jaques, 1955) or “annihilation anxiety” (Hirschhorn & Young, 1991).

There is extensive literature about how work groups and organizations attempt to cope with their anxiety. Some of this is based on the work of Klein (1946), who showed how individuals cope with anxiety by using the “manic defense.” The manic defense combines the psychodynamic processes of splitting, introjection and projection (see Morgan, 1986, for a comprehensive listing of psychodynamic concepts). Splitting is the result of the elemental struggle between life and death mentioned above--people separate (split) the “good” aspects of their existence from the “bad.” They project bad onto others and introject good into themselves. Hirschhorn (1988) showed how the manic defense can be used by work groups and organizations. An anxious manager may split good and bad by considering himself omnipotent (introjecting good) at the same time that he views lower-level participants as unworthy (bad). The manager may almost literally project these feelings onto workers by punishing them--with extra work, unreasonable schedules, unachievable goals, and so forth. Inspired by Klein, Bion (1959) did extensive work with groups in leaderless, and therefore anxiety-provoking, situations. Out of this work he identified three “basic assumption” defenses against group anxiety. These defenses are designed to help the organization and its members cope with their anxiety. The first is dependency, where a group ceases trying to solve its problems in a healthy way while it waits for a “messiah” to save it. The second is pairing, where two ostensibly “good”

actors who are related to the group (two group members, or one member and a consultant, or even one member and a faddish management concept) combine to undermine and eliminate a “bad” leader. Lastly, Bion identified flight/fight, which occurs when the members of a group cease constructive problem-solving by either (1) blaming all the group’s problems on an outside agent or (2) pretending that no problem exists. As we will see later, Klein’s and Bion’s behavioral models of anxiety are the most relevant for the present study. Jaques (1955) and Menzies (1960) showed how anxiety in organizations can take on a form different from behavior, even resulting in an organization’s structure (in the sense of hierarchy) becoming a defense mechanism. Issues not addressed by these researchers, but addressed in the present paper, is how organizational anxiety manifests itself in an organization’s cognitive schema (Weick, 1979) and how that schema can provide an “auxiliary causal account” (Lofland & Lofland, 1984) of the dynamics of organizational anxiety.

Collective mental models and systems thinking

Weick (1979) suggested that, through a process of enactment, selection and retention, an organization’s members create a cognitive schema, or map, of the most important aspects of their collective experience. This schema channels future action, leading to further refinements of the map, leading to future action, and so on. Senge (1990) describes the phenomenon of cognitive maps using the term “mental models,” which can

apply to either individuals, groups or organizations. Kim (1993) describes a process by which individual mental models are combined into organizational ones.

Senge (1990) defines mental models as one of the five key disciplines of learning organizations, but another of these disciplines is systems thinking--understanding how the many elements of an organization are connected and interrelated. Senge (1990) describes how dynamic structures like mental models of systems can be described with causal loop diagrams. These are diagrams composed of causally linked system elements whose linkages are symbolized by arrows. An increase or decrease in the value of the component at the tail of the arrow affects the value of the component at the head of the arrow. Positive causal links (“+” at the arrowhead) indicate that the values move in the same direction, i.e., an increase in A leads to an increase in B. Negative causal links (“-” at the arrowhead) indicate that the values move in the opposite direction, i.e., an increase in A leads to a decrease in B. System components are connected in closed unidirectional paths that result in feedback loops. Causal structures dominated by reinforcing feedback loops generate behavior which moves component values progressively away from initial or equilibrium values. In contrast, structures dominated by balancing feedback loops generate behavior which resists continued change in a given direction and which directs system behavior toward a goal or equilibrium condition (Goodman, 1974). Balancing feedback loops and reinforcing feedback loops combine to produce much of the behavioral change observed over time in organizations (Forrester, 1961; Senge, 1990).

Bougon, Weick and Binkhorst (1977) empirically demonstrated Senge's idea by developing the cognitive map of the Utrecht Jazz Orchestra. This map contained many reinforcing loops and a small but important number of balancing loops. Another example is Voyer and Faulkner (1989), who showed how the leadership style of a jazz ensemble's leader became imbedded in the organization's cognitive map as the only balancing loop. In the present paper we examine the issue of how anxiety might appear in an organization's collective mental model.

Research question

The present paper will address how one organization dealt with the anxiety that was a salient aspect of its existence. The central research question is, "How is anxiety incorporated into an organization's mental model?" Secondary questions are, "What was the source of the anxiety?" "How does the anxiety system created by the members of an organization channel their action?" Lastly, "Did the organization's mental model typify any of the theory on how organizations manifest and cope with anxiety?"

What the present paper will show is that people in the studied organization create dynamic conceptual structures whereby organizational anxiety generates and influences organizational behavior, leading to even more anxiety in the organization. The paper will also show that well-known constructs of organizational anxiety are central to this conceptual structure. The findings of the present study go beyond merely supporting the existence of these constructs. Using causal loop diagramming to reveal its dynamics, the

study allows a new and deeper understanding of the phenomenon of organizational anxiety. The general approach of the paper is a qualitative, in-depth look at one large organization. Data gathering methods are a blend of participant observation, unstructured interviewing and causal loop diagramming followed by qualitative analysis of the data. To ground the reader we begin with a description of the setting.

Description of Setting

Computer Chips International (CCI) is a large manufacturer of semiconductors. The fieldwork for this research took place at CCI's Seaport Plant, located far from CCI's corporate headquarters. In early 1993 CCI's Data Shaping Division (DSD), located in the Seaport facility, became involved in a research project designed to assess how the concepts and tools of learning organizations (Senge, 1990; Senge et al., 1994) can enhance the effectiveness of organizations like the Data Shaping Division. Data for the present paper came from an early stage of this project.

Brief history of the Seaport facility

Originally built and owned by another company, the Seaport facility was started in the early 1960s by a manager with ties to the Seaport area. Over the years, the plant's parent changed many times. The Seaport facility was initially set up as a computer chip fabrication facility. Today, it still has a large "fab," but also has substantial research and development capacity. The Data Shaping Division, which is the dominant division housed at Seaport, has developed a distinctive competency in the design and fabrication

of low-priced, commodity-like computer chips. The Seaport facility has also been very successful at taking on financially troubled products from other parts of CCI (and its predecessors) and turning them around. It has had a good record of implementing management techniques aimed at improving quality, even going so far as to submit several credible Baldrige Award applications.

Like many firms in the semiconductor industry, CCI has had its share of fluctuations. The Seaport plant has been through three owners, each of whom has manipulated the size of its labor force--expanding it during upturns, shrinking it during downturns. At the time of this research, the labor force at Seaport was approximately 1,800, substantially below the peak number of about 3,000. The fluctuations have had a powerful effect on the culture of the Seaport facility, a facility generally agreed to be distinctively different from the corporate headquarters. The effect has been to create a very strong work ethic among the staff, based partly on a desire to avoid layoffs by being the best at what they do.

The distinctiveness of the culture is heightened by Seaport's location. The Seaport area has a very attractive quality of life. It has substantial natural beauty that is enhanced by a relatively low cost of living, good schools and reasonable access to major urban centers. Most of the fab workers are from the immediate area and wish to remain, but even the professional engineers, most of whom come from somewhere other than the Seaport area, have developed a strong desire to remain. A major issue for them is that there are no other semiconductor facilities in, or even within hundreds of miles of,

Seaport. An engineer laid off from a company in California's Silicon Valley has an easier time finding another position with essentially the same commute. By contrast, a layoff from the Seaport facility means a move to another part of the country, distant from the Seaport area. Few workers at Seaport are enthusiastic about such a move. Voluntary turnover is lower at Seaport than anywhere else in the semiconductor industry. Many people have been working there for over a decade, which is significantly longer than the average for this industry.

Description of the situation during the present research

Constrained resources led the Data Shaping Division and the researchers to focus their initial efforts on a subunit, the Progressive Logic Department. At the time this department had approximately one hundred engineers working in five units, four on various aspects of product development (design, testing and support) for four product lines, with one unit performing a support function. Two units, representing the largest volume of products were developing relatively low-priced, commodity-like computer chips. The other two units were in the early stages of developing more innovative chips, which was a departure for the division. The commodity chips were "cash cows" for the entire CCI corporation, not just the Data Shaping Division. A group of insiders working with the research team believed that the Division was only a temporary home for the more advanced chips, which was "protecting" them under its cash umbrella until they could

operate on their own. This was a customary role that the Division had come to play in CCI.

The research reported here occurred over a one-year period from August 1993, to July 1994. During the fiscal year immediately preceding this period, CCI had experienced the highest profit in its history. A large percentage of this profit had been generated by Data Shaping, and in turn a significant amount had been based on the success of Progressive Logic. The resulting cash flow encouraged the management of the Division to invest in things designed to maintain the profit momentum. Accordingly, five people were selected from various parts of Progressive Logic (along with two Division staff people) to look into new ways of thinking about how to reduce cycle time for the division. This group became known as the Inception Team. The team decided (among other things) to form an alliance with a university research center by being the site for a pilot project.

Research Methods

Seven Inception Team members and three researchers affiliated with the university center made up the pilot project research team, creating a mix of inside and outside perspectives and expertise. The inside members were from design, testing, marketing, and human resources. The outside members were the project manager, who was a person extremely well versed in the five disciplines of the learning organization, one member expert in system dynamics modeling, and one member with skill and experience in qualitative field research and organization theory.

Data gathering

All inside members of the team were trained in qualitative data gathering, primarily the recording of field notes, qualitative interviewing and participant observation (Glaser, 1978; Glaser & Straus, 1967; Lofland & Lofland, 1984; Taylor & Bogdan, 1984). Five of the Inception Team's members became active interviewers and participant observers. To triangulate (Guba & Lincoln, 1982), one of the outside members of the team also did a great deal of participant observation.

The team's inside members were also trained in systems thinking. The primary emphasis was on developing the ability to appreciate feedback in organizational systems (Forrester, 1961) by doing causal loop diagramming (Richardson & Pugh, 1981) and understanding systems archetypes (Senge, 1990).

Over a six-month period, forty (out of approximately one hundred) members of the Progressive Logic Department were interviewed by four inside members of the research team. In unstructured interviews, the respondents, who represented a broad cross section of Progressive Logic, were asked to reflect on things that enabled and things that inhibited new product development. Also, an average of two meetings per week was observed by two inside research team members and one outside research team member. The meetings were of various types--planning, technical, and management--cutting across all five units of Progressive Logic. Lastly, the inside members of the research team kept

field notes on ongoing interactions they had with other people in the Progressive Logic Department.

Data analysis

The inside members of the research team were also trained in analytic methods for qualitative data. Subsequently, all ten members of the team engaged in qualitative analysis of the data gathered as described above. The analysis was done pursuant to guidance provided by many scholars in this field, such as Glaser, 1978; Glaser & Strauss, 1967; Lofland & Lofland, 1984; and Taylor & Bogdan, 1984. First, all participants reread at least some portion of the data; any given subset of the data was read by at least two members of the team. Second, the research team met in a series of day-long analytic sessions designed to make systematic sense of the data (Glaser, 1978; Lofland & Lofland, 1984; Taylor & Bogdan, 1984).

Third, in these meetings the research team uncovered several important themes: Communications, Learning, Incentives, Resources, Decision Making, Management Interactions, Metrics and Anxiety. (The first seven themes are beyond the scope of the present paper, which is focused on the way the division's members handled the changes over time in their collective anxiety.) Fourth, after the identification of the major themes, the team's members discussed the order in which they would try to analyze them more deeply. They quickly reached a consensus on anxiety as the most important and interesting of the themes. Fifth, the team's members, working as individuals, wrote theoretical

memos (Glaser, 1978) attempting to capture more detailed interpretations of the anxiety theme. Sixth, the team came together again to share their memos. At this point, an innovative event occurred in the team's data analysis.

During their preparation for qualitative data gathering and analysis, the team had discussed Lofland and Lofland's (1984) observation that most qualitative data analyses, like the one here, tend to be static--describing, in some detail, a given setting at a point in time. In their discussion, Lofland and Lofland urge qualitative researchers to attempt "auxiliary causal accounts" that explain some of the observed phenomena in more dynamic ways. Members of this team felt that Lofland and Lofland's suggestion of looking at "cumulative effects" was remarkably similar to the systems thinking approach (Senge, 1990) in which they had been steeped during this study. The methods used in the present study, particularly causal loop diagramming, allowed the team to implement Lofland and Lofland's recommendation, and at the theoretical memo stage, one team member did. Motivated by his exposure to causal loop diagramming (and the Loflands' insights), this member's memo was graphical instead of verbal. After he shared his diagram, the entire team, using the data its members had gathered and analyzed, devoted itself to refining the diagram into a causal loop diagram of the organizational schema or system that the division's members had created. It is this finding, to be discussed below, that makes up the heart of the present paper. It should be mentioned that although the causal loop diagram incorporated all the major themes mentioned earlier, only the loops

related to organizational anxiety are examined in the present paper. The relevant portion of the causal loop diagram is shown in Figure 1.

Data checks

Guba and Lincoln (1982) offer several criteria for evaluating, and strategies for assuring, the rigor of qualitative research projects. They argue that data from any scientific inquiry must meet four tests: (1) truth value, also known as internal validity or credibility; (2) applicability, usually called external validity or transferability; (3) consistency, the well-known criterion of reliability or dependability; and (4) neutrality, the extent to which the data are confirmable or “objective.” Several checks were used in the present study to help pass these tests.

Internal validity or credibility was fostered by using several strategies. The research team had prolonged engagement with the site. Indeed, the “inside” researchers had all worked there more than ten years and had extensive local knowledge. Indeed, it could be argued that credibility is a real strength of the present study. To help matters in this regard, the “outside” members of the research team maintained multiple-times-per week, persistent involvement for almost a year and became very knowledgeable about conditions at the field site. All members of the team, inside or outside, checked their assessments with their peers. The use of several data sources and the inside-outside nature of the research team introduced a high degree of triangulation to the research effort.

External validity or transferability was strengthened by the very nature of the site studied. Data were gathered from forty diverse members of a rich field site very much embedded in the “real world” of the semiconductor industry.

Reliability or dependability was improved through triangulation. The research team used different sources of data to reach its conclusions, primarily participant observation and recording of field notes (by both inside and outside members) and qualitative interviewing. The research team also continually and self-consciously examined the reliability of its processes, and this enhanced reliability.

Lastly, objectivity was improved by the training in qualitative research methods (mentioned earlier) received by the inside researchers, to make sure that data were gathered in as verbatim a manner as possible, and by constant dialogues among the research team regarding biases and preconceptions, including those that might arise during data analysis. Reduction of bias was aided considerably by the inside-outside composition of the research team.

Findings

The findings of the Inception Team concerning organizational dysfunctions they found in the Progressive Logic Department were many and varied. As mentioned earlier, the CCI research team drew an extensive causal loop diagram that captured many of these factors. The present paper focuses on one part of that systemic diagram--the organization's collective anxiety and how it was handled (see Figure 1).

Figure 1 about here

It is important to note that nothing in the diagram in Figure 1 represents anything “objective.” The items named and the causal relationships depicted in Figure 1 were generated by the inside members of the research team, based on their interpretation of the gathered data and their own local knowledge. It is a representation of the cognitive map (Weick, 1979) enacted by the members of the Progressive Logic Department. It represents “sensible” and “plausible” sensemaking (Weick, 1989) by the members of that department. It does not in any way represent some sort of objective assessment of anxiety.

Four of the five elements typically found in causal loop diagrams are depicted in Figure 1. First are the variables, such as Anxiety and Search for Daddy. (For the balance of the present paper, variables in figures will be written in Initial Capitals, as were the two examples in the previous sentence.) It is worth noting that the specific wording of the variables is idiosyncratic to the members of Progressive Logic. For example, Only Game in Town refers to how the Seaport plant is the only semiconductor facility within hundreds of miles, resulting in a feeling of limited alternate employment opportunities. Table 1 provides a glossary for those variables that are particularly idiosyncratic.

Table 1 about here

Second, there are positive links between elements of the system. For example, three factors--Only Game in Town, Perception of Failure, and Layoffs--cause increased anxiety when they increase. Third, Figure 1 shows negative links where changes in one element lead to changes in the opposite direction for the other. For example, as Understanding increases, Resources Used to Make a Decision decrease, and, vice versa, as Understanding decreases, Resources Used to Make a Decision increase. Fourth, there are three reinforcing loops (i.e., loops that move the system away from equilibrium) in the Department's cognitive schema, identified in Figure 1 as R1, R2 and R3. These, which all relate to anxiety, make up the present study's most significant findings, and will be discussed in detail below.

The only element typically found in causal loop diagrams that is missing here is the balancing feedback loop. This indicates no inclusion of "control" factors in the schema that make the system return to equilibrium after a disturbance. Reinforcing loops, in contrast, tend to amplify disturbances and move the system further from equilibrium. It is noteworthy that all the loops identified by the internal members of the research team in this organizational system amplify the focal phenomenon--Anxiety--and no loops help keep it under control. (The portions of the cognitive map excluded for the purposes of

the present paper did not contain any loops, reinforcing or balancing, that connected to Anxiety.)

Anxiety reinforced

The “Messiah” loop. The first reinforcing loop is R1. As Anxiety about the organization’s performance increases, the members of the Department Search for Daddy, i.e., they look for a savior. This search reduces the organization’s Accountability, in turn reducing (because of the positive link) its Perceived Ability to Succeed, which increases (because of the negative link) Anxiety. So, an increase in Anxiety leads to even more Anxiety.

The R1 loop corresponds quite well to Bion’s idea of dependency as a defense mechanism, hence the label “Messiah Loop.” Dependency is where an anxious group or organization waits for a messiah to save it. Progressive Logic respondents framed this as a Search for Daddy. The irony here, similar to what Bion pointed out for his respondents, is that dependency not only is ineffective as a defense or coping mechanism, it actually can set in motion a systemic logic that is self-defeating--the result of the Search for Daddy is more Anxiety, not less.

The organizational learning literature shows this loop as having the characteristics of a “shifting the burden” systems archetype (Senge, 1990). The organization searches for the “messiah,” but suffers the unintended consequences of weakening its internal coping mechanisms and strengthening its external dependencies. Figure 2 illustrates this

archetype. Instead of addressing the anxiety problem directly by increasing their Capacity to Perform (loop B1 in Figure 2), the organization's members attempt to shift

Figure 2 about here

their burden to an intervener by Searching for Daddy (loop B2 in Figure 2). Were organization members held accountable, rather than Searching for Daddy they would feel Pressure to Learn and Perform. But the Search for Daddy reduces Accountability, in turn reducing the Pressure to Learn and Perform, which reduces the Capability to Succeed, ultimately increasing Anxiety, forming a reinforcing loop (loop R1 in Figure 2). A healthier response to anxiety would be to learn and to perform, thereby reducing anxiety in a more fundamental way. But the "quick fix," for which the shifting the burden archetype is noted, reduces the system's need, and ultimately its ability, to apply the fundamental solution.

The "Manic Defense" loop. Reinforcing loop R2 works differently. Increased Anxiety leads to increased Focus on Metrics, which in turn causes the Resources Used Measuring to go up. As measurement increases, the Resources Available for a Project are reduced, which increases the Resources Requested. This in turn lowers the Percentage of Resources Received, reducing the Perceived Ability to Succeed and ultimately increasing Anxiety.

Loop R2 captures the collective enactment of Klein's manic defense, leading to the label "Manic Defense Loop." Anxious managers project the organization's problems onto their subordinates and seek to punish them. They operationalize this punishment with a hyper-focus on quantitative metrics, slavishly using them to control organizational action. Through this emphasis on metrics, the managers deplete the organization of the physical, financial, and perhaps most importantly the psychological, resources its members need to succeed. This ultimately leads to higher levels of anxiety.

The organizational learning literature describes this as a "fixes that fail" systems archetype (Senge, 1990), as depicted in Figure 3. In this archetype an intended policy of

Figure 3 about here

reducing anxiety by increasing performance (Figure 3's loop B1) is thwarted by unintended consequences associated with the focus on quantitative metrics. These side effects (loops R1, R2, R3 and R4 in Figure 3) serve to negate the effectiveness of that focus. For example, the intended effect of Focus on Metrics is to raise performance, which should reduce Anxiety, as shown in balancing loop B1 in Figure 3. However, the Focus on Metrics has at least three unintended side effects. First, Perception of Punishment increases, which (after a delay) increases Anxiety (loop R3). Second, as depicted in the original causal loop diagram of Figure 1, the Focus on Metrics increases the Resources

Used Measuring, reducing the Resources for Project Work, which, after a delay, lowers Project Output, leading to an increase in Anxiety (loop R4 in Figure 3). Third, the Focus on Metrics often leads management to pull revenue into the current quarter from the following quarter. The financial gimmickry of this move directly raises Anxiety (loop R1), but it also substantively degrades performance--the next quarter's financial results are depleted, raising Anxiety after that delay (loop R2).

The “Fight” loop. In the third reinforcing loop in Figure 1, R3, increased Anxiety leads to increased Internal Competition, which leads to a greater Need to Be Right. Increasing the Need to Be Right reduces the Number of Questions Asked, which lowers Understanding and increases the Resources Used Making Decisions. The rest of the loop follows the end of the R2 loop, with the result of even greater Anxiety.

This loop is the systemic enactment of one side, fight, of Bion's flight/fight basic assumption defense. Anxiety leads to Internal Competition, as all members of the organization seek to secure their places in the face of uncertainty, layoffs, etc. As the stakes rise, the Need to Be Right (Argyris, 1990) rises, and inquiry is discouraged in favor of “winning” at all costs. The resultant decrease in Understanding taxes the fixed pool of Resources Used to Make Decisions, which reduces the Resources Available Per Project (and by implication reduces the probability of success), which increases Anxiety. Again, as Bion pointed out in his work, this “defense” mechanism against anxiety has the opposite effect--when it is used, anxiety increases.

This systemic behavior is symptomatic of a lack of shared vision (Senge, 1990).

Irrational decisions are made when a larger purpose and goals are poorly defined. Also, members of the organization need to develop the capacity to question their individual mental models and the mental models of others. To overcome the fight loop, it is vital to examine mental models while defusing the defensive routines (Argyris, 1990), like the Need to Be Right, that block learning.

In summary, the mental model of anxiety held by the members of the Progressive Logic Department is a grim one. All the loops are reinforcing. This is good if something starts to move anxiety downward, because the reinforcing loops will reduce anxiety even more, in a kind of virtuous circle. Unfortunately, what seems to exist in this organization is a vicious circle. All the reinforcing loops point to an increase in anxiety and a steady worsening of the situation.

Answers to research questions

It is important to point out that these findings provide a clear answer to the research questions posed earlier. First, this organization has experienced pervasive anxiety, based on a long period of fluctuating performance, a history of layoffs, and distance from similar facilities (which would make relocation difficult). Such an organization will incorporate this anxiety into its mental model. That is not so surprising. Second, what is surprising is that the structure of the mental model, and the behavior it shapes, incorporates defense mechanisms that are well known to scholars. Unfortunately, given the way

the elements of the mental model are stitched together, using those defense mechanisms results in more, not less, anxiety. In other words, the mental model created in response to organizational anxiety is designed to help cope with the problem, but succeeds mostly in exacerbating it. The firm's history would indicate that anxiety has at best fluctuated over time, and has not been successfully eradicated.

Discussion

Lack of balancing loops

The lack of balancing loops is a remarkable feature of Progressive Logic's mental model of its anxiety. As mentioned earlier, balancing loops are the "control" factors in a system, what makes the system return to equilibrium after a disturbance. Reinforcing loops, by contrast, tend to amplify disturbances and move the system further from equilibrium. All the loops in the Progressive Logic schema tend to increase anxiety; there are no loops to dampen it.¹ Perhaps anxiety was so salient in Progressive Logic that at the time they were producing the data for their causal loop diagram (in Figure 1) the division's members simply weren't thinking about links that might keep anxiety within bounds. Another study of CCI found a lack of balancing loops in the department's product development process (Ford, 1995).

In other empirical studies of organizational cognition, Axelrod (1976) and Bougon, Weick and Binkhorst (1977) found that organization members tended not to identify balancing loops. Bougon, Weick and Binkhorst (1977), in a detailed analysis of the cause

map of the Utrecht Jazz Orchestra (UJO), found evidence that this phenomenon was tied to a desire for consistency on the part of their respondents. For example, they found that if UJO members thought that the link $A \rightarrow C$ was positive, they tried to avoid identifying loops where the result of the chain $A \rightarrow B \rightarrow C$ was a balancing loop, i.e., one where a rise in A led to a decline in C. This explanation is unconvincing in the present case, where members of the internal research team had received extensive exposure to causal loop diagramming and analysis, and had no apparent compunctions about identifying balancing loops, as evidence by the many negative links they identified. However, the team was working from the qualitative data gleaned from interviews, field notes, and so forth, and those data did not provide any evidence that the members of Progressive Logic saw any balancing loops. A more likely explanation for the absence of balancing loops in this case is the long and pervasive existence of anxiety in the organization (as discussed earlier) which led to a focus on how anxiety worsened, not how it could be alleviated. Nevertheless, since the site has been successful for decades, one would think that some balancing loops exist, otherwise the site would have devolved to anxiety-induced paralysis. Some of these balancing loops were identified through the development of a system dynamics model (Ford, 1996).

The archetypes depicted in Figures 2 and 3 illustrate balancing loops that might exist in a situation such as the one researched here. Because of delays in these systems, it is likely that anxiety would oscillate, i.e., rise and fall. For example, in the “shifting the

burden” archetype (Figure 2) the speed of the quick fix would, for a time, mask the fundamentally deteriorating position of the firm, keeping deeper anxiety at bay for a while, only to have it return. In the “fixes that fail” archetype (Figure 3), the deleterious effects of focusing on metrics do not take effect until after a delay, so anxiety decreases before it increases again. In both situations, anxiety falls in the short run but rises in the long run.

Three exogenous factors--Only Game in Town, Perception of Failure, and Layoffs--are shown in the schema to cause anxiety. Of these, Only Game in Town is the only real exogenous factor. One could easily hypothesize some negative links between Layoffs and Perception of Failure and others in the schema that would create balancing loops. For example, were Resources Available Per Project to go up, Layoffs would go down, reducing Anxiety, reducing the Focus on Metrics and the Amount of Resources Used Measuring. This would increase the Resources Available Per Project, further reducing the Threat of Layoffs and therefore reducing Anxiety.² Another plausible negative link would go from Perceived Ability to Succeed to Perception of Failure. As the Perceived Ability to Succeed increased, Perception of Failure would certainly decrease, as would Anxiety. Lastly, it is possible that the members of Progressive Logic have developed coping mechanisms in their private lives (e.g., loving families, close-knit religious communities) that ameliorate their collective anxiety. Perhaps because these are so idiosyncratic to each member, these do not appear in the Department’s cognitive map.

These hypothesized links were not salient to the members of Progressive Logic at the time the data were gathered. Otherwise, they would have included them in their schema. But prior to doing this exercise, the Department's members did not know about the systemic nature of their anxiety, either. After gaining some insight into the systemic structure of their collective anxiety, they might admit that something has to be keeping it within bounds. Perhaps gaining better insight into the Department's objective success would help reduce anxiety. Or perhaps, as Klein (1948) suggested, members need to achieve the "depressive position," a realistic view of the negative and positive things about the organization. A cognitive schema that contained the links in Figure 1, along with the links hypothesized above, might be a fair representation of a collective depressive position. Lastly, the systems archetypes depicted in Figures 2 and 3 also help to explain how anxiety is controlled. The quick fixes of looking for a savior and focusing on metrics help improve performance in the short run, but in the long run the anxiety problem is worse. So rather than flying out of control, anxiety oscillates and is easier to deal with in its "down" cycles.

Endogenous nature of anxiety

It is noteworthy that the anxiety loops already in Progressive Logic's causal loop diagram are endogenous. In other words, much of the anxiety that the members of Progressive Logic face is of their own creation, or at least of their own intensification. Bion (1959) and Klein (1948) hinted at this, but Progressive Logic's schema is empirical

evidence showing that defense mechanisms against organizational anxiety tend systematically to increase it. This is an example of what Forrester (1971) calls the “counter-intuitive behavior of social systems.” In any case, it is good news, for whatever people create in a system, they can change if they gain insight about it. System dynamics (Forrester, 1961) offers some suggestions about changing systems. There are essentially three: strengthen “good” loops, weaken “bad” loops, or change the structure of the system by deleting or adding feedback loops.

Strengthen “good” loops. In the case of Progressive Logic’s anxiety schema, there are no good loops; all three loops in the system result in greater anxiety. So, there is nothing to strengthen.

Weakening “bad” loops. There are three “bad” loops that might be weakened. For example, the “manic defense” loop might be weakened by a conscious reduction of the focus on metrics. Progressive Logic’s management could, if they received adequate support from their management, reduce the number of, or use more relevant, metrics; increase the division’s ability to respond to customers and not internal metrics; reduce bureaucracy; free up Resources Dedicated to Measurement, and so on. These are all things that are possible, and all things that would weaken the manic defense loop. The “fight” loop could be weakened by reducing internal competition; reducing the need to be right; increasing the saliency of asking good questions; or otherwise reducing the resources used in making decisions. The “messiah” loop could be weakened by reducing

the desire to or effectiveness of a “search for daddy” and by increasing empowerment and accountability.

The strength of the loops in Progressive Logic’s causal loop diagram is no doubt affected by various parameters (Forrester, 1961). For example, some parameters affect the strength of the organization members’ desire to Search for Daddy. Finding that parameter would help in designing a strategy to weaken the loops in which Search for Daddy appears. Obviously, finding out what those parameters are would be real leverage points (Senge, 1990) in the anxiety system. Unfortunately, the present study did not uncover these parameters; that awaits further research.

Changing the structure of the existing system. This involves adding links to or removing links from the schema to destroy old or create new feedback loops. Several suggestions for adding links were already made earlier in the section on the absence of balancing loops. But there are other links that could be added. Indeed, it is difficult to imagine many of the previous subsection’s changes happening without some additional links.

For example, one of the objectives of the university center’s research is to increase the Use of Inquiry Skills by Progressive Logic’s members (see Figure 4). Inquiry skills are

Figure 4 about here

methods of conversation that can be used to overcome organizational and interpersonal barriers to understanding and learning. They are described in detail in Argyris (1990), Bohm (1996) and Isaacs (1993). Should the project succeed, in response to increased Anxiety the members of the organization would invoke greater use of those skills, which by their very nature would decrease Competition and the Need to Be Right, and would increase Questions, thereby increasing Understanding in several ways. This would reduce the Resources Used in Making Decisions, increasing the Resources Used on the Projects, raising the Likelihood of Success, ultimately reducing the Anxiety level. These same inquiry skills, it is posited, would help Progressive Logic's members understand the counterproductiveness of Searching for Daddy, thereby weakening a "bad" loop. They would realize that they are their own best hope for success. This would increase their Accountability, ultimately reducing Anxiety.

The changes in the manic defense mentioned earlier are not likely to come unless management realizes the self-defeating quality of their projections onto others in the organization. Here is an instance where it is hoped that the removal of causal links from the schema will significantly change the feedback structure. See Figure 4 for a depiction of the links that would be removed and Figure 3 for a depiction of the "hidden" links that would be removed and would thereby reduce the likelihood of a fix that fails. If management better understands the anxiety-intensifying system they have created, it may motivate them to remove the links that make up the manic defense loop. Instead of

projecting their anxiety onto the “bad” others in the organization, management would recognize both the good and the bad in the way the organization operates. In a difficult but fundamentally healthier process, the organization’s members would examine things in a way more systemic than traditional metrics allow and would join together to do the work needed to improve performance.

Conclusion

The present study provides strong empirical support for the idea that the members of an organization that experienced lengthy anxiety would enact a cognitive map that includes some well known theories of anxiety in organizations. The study demonstrated that two of Bion’s (1959) basic assumption defenses--dependency and flight/fight--and also Klein’s (1946) manic defense were incorporated into the cognitive map of the Progressive Logic Department. While Bion and Klein demonstrated the existence of these phenomena in small groups and individuals, respectively, the present study showed how they are manifest in the causal schema of an organization with more than one hundred members.

Our work expands traditional views of organizational anxiety by using causal loop diagramming to help think through the dynamic effects on organizational behavior of organizational anxiety. This tool is potentially helpful for research purposes, but also as a way for organizational members to better understand anxiety in their workplaces, and thereby improve their situations.³ Organizational members want to know how to improve

organizational performance and are probably very interested in reducing dysfunctional organizational anxiety, which in itself might help improve performance.⁴ Causal loop diagramming gives them a tool for improved mapping, and for improved understanding, of dynamic phenomena, in this case anxiety. This in turn creates the opportunity for taking steps to improve performance.

Researchers are, or should be, interested in helping to make those things occur. Much of the literature on organizational anxiety has been good at description and explanation, but short on ways to help. There has been some very useful discussion of ways to help individuals and smaller groups (see, for example, Kets de Vries & Miller, 1984; Kets de Vries & Associates, 1991), but relatively little discussion of ways to help entire organizations. The present research shows an avenue that might help.

The approach reported here starts with the organization's members drawing a causal loop diagram that gives them greater shared insight into how they create their own problems. The second step would be to find the possible leverage points in the system. This would start by examining the links and loops in the causal loop diagram, but would be greatly assisted by system dynamics simulation (Forrester, 1961; Richardson & Pugh, 1981). Modeling the system would require participants to identify the parameters that they hypothesize affect the strength of the loops and it would provide a means of testing those hypotheses. Modeling would also facilitate the redesign of anxiety-producing structures. It is in these parameters and new designs that the leverage points are likely to

be found. The third step would be to co-design interventions that apply pressure to those leverage points. In this case, the suggested interventions involve tools--particularly inquiry skills--used to deepen collective self-knowledge even further. The hoped-for outcome would be less reliance on self-defeating defense mechanisms and greater reliance on inquiry and on the organization members' own self-knowledge, skills and resources.

Because it is such an endemic phenomenon, organizational anxiety is easy to dismiss as something over which people have little control. The present paper demonstrates that, on the contrary, the people caught up in anxious organizations create mental models that channel organizational behavior in ways that contribute to and worsen the problem. Far from being unable to control anxiety, people in organizations have the tools to understand better how they contribute to the problem, and with this greater understanding they can take intelligent steps to improve their situation and their effectiveness.

Notes

1. However, as previously noted, reinforcing loops work for the good as well as the bad. Were something to start anxiety going down, the reinforcing loops would keep that beneficial effect going. There was no evidence in this instance that such an event occurred or was on the minds of Progressive Logic's members.
2. On the other hand, there might be a different loop altogether--increasing the resources spent on a project might lead to even greater pressure on metrics like Return on Investment. In this fix that fails, anxiety would go up with an increase in funding!
3. It must be noted that the present study focused on organizational anxiety because that was salient here, but any other phenomenon of interest could be studied, and its deleterious effects ameliorated, using these methods.
4. Although it should be mentioned that a moderate degree of anxiety might be functional, acting as a kind of energizer. See, for example, Schein (1993), who discusses "Anxiety 1" (a feeling that inhibits learning because the learning would be too disruptive or difficult) and "Anxiety 2" (fear, shame or guilt associated with not learning anything new). Schein says that the key is to create enough Anxiety 2 to prod learning, but not so much that it, too, becomes paralytic.

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Table 1

Glossary of Idiosyncratic Terms Used in

Progressive Logic Mental Model

Accountability:	Being truly empowered to act on business initiatives.
Focus on Metrics:	Responding to short-term setbacks by strenuously increasing the emphasis placed on meeting financial targets.
Need to be Right:	In the heated internal rivalries that characterize CCI, it is imperative to “win.”
Only Game in Town:	The Seaport facility is the only semiconductor site within hundreds, perhaps thousands, of miles. Loss of a job here means substantial dislocation and relocation.
Questions:	A willingness to get into an “inquiry mode” and learn about issues facing the company
Search for Daddy:	Responding to anxiety by looking for management to “bail you out” or tell you what to do.
Understanding:	Grasping the essence of the issues facing the company.

Figure Captions

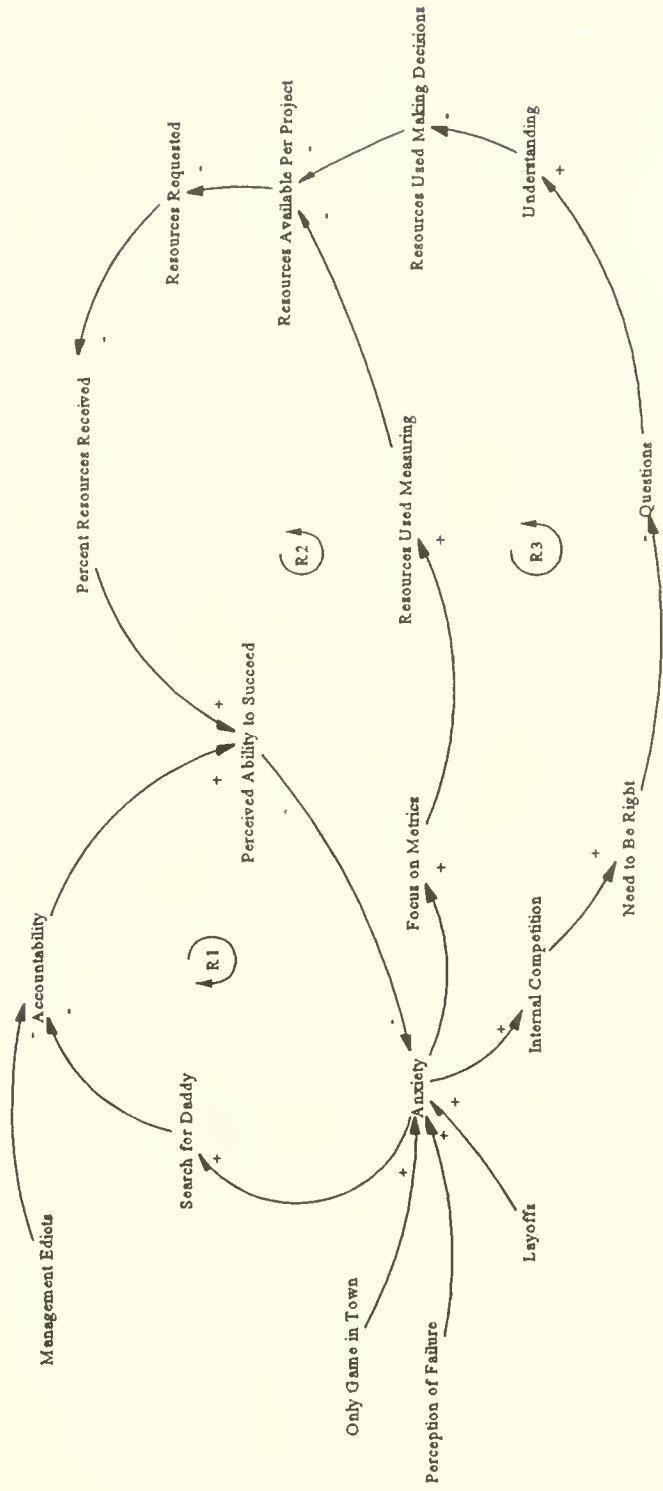
Figure 1. Anxiety system in the Progressive Logic Department.

Figure 2. Dependency defense mechanism as a shifting the burden systems archetype.

Figure 3. Focus on metrics: A fix that fails.

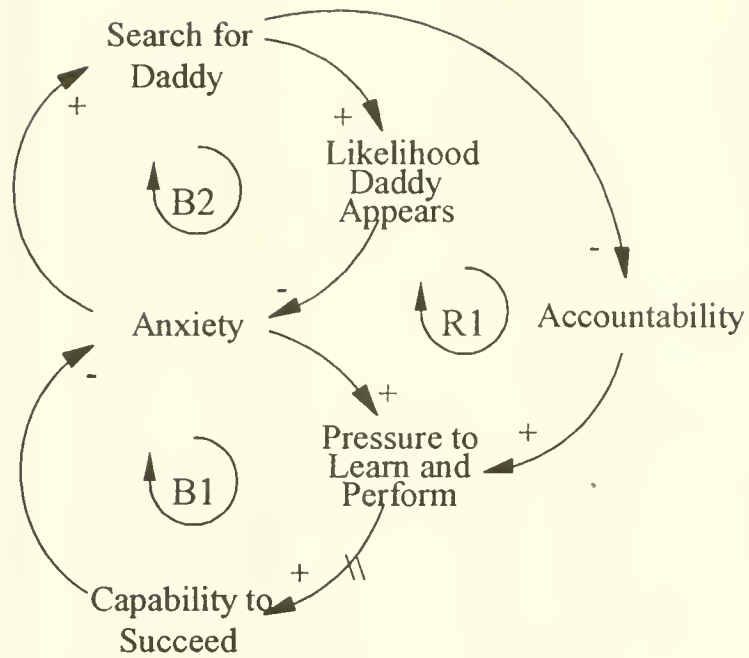
Figure 4. Suggested changes to Progressive Logic Department anxiety system.

Top



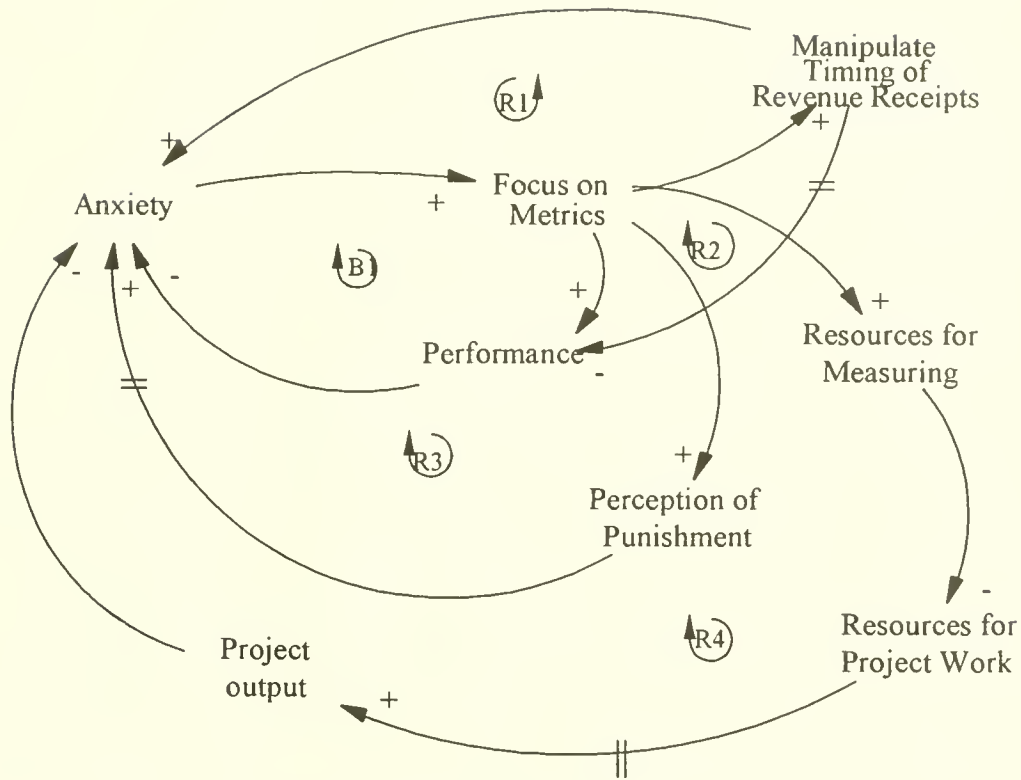
+ = positive link; variable at head of arrow moves in same direction as variable at tail
 - = negative link; variable at head of arrow moves in opposite direction as variable at tail

Figure 1 Anxiety system in the Progressive Logic Department



Note: “=” signifies a delay

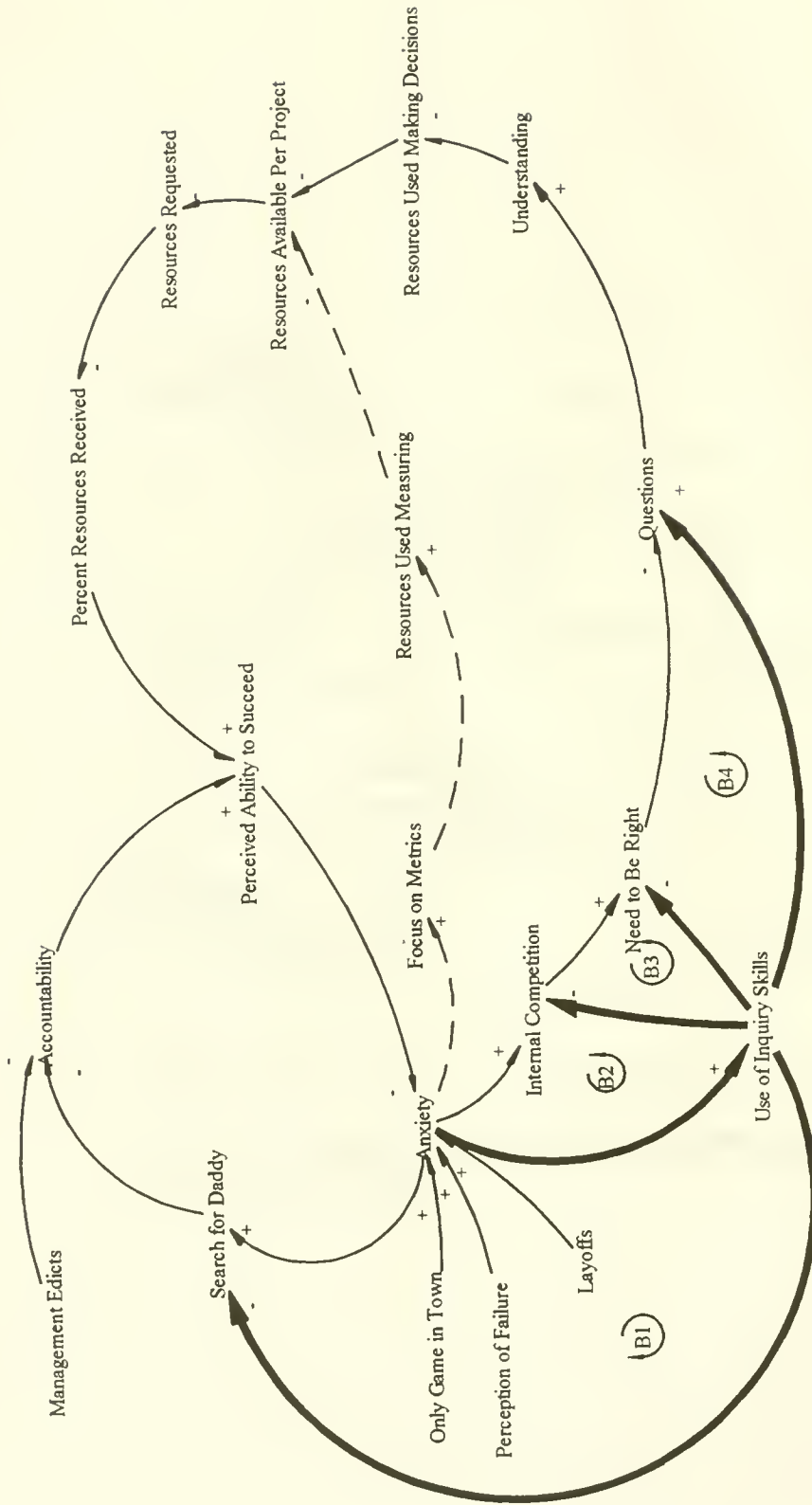
Figure 2 Dependency defense mechanism as a shifting the burden systems archetype



Note: “=” signifies a delay

Figure 3 Focus on metrics: A fix that fails

Top



Added links shown as bold arrows

Deleted links shown as dotted arrows

Figure 4 Suggested changes to Progressive Logic Department anxiety system

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