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The Attribution of Causes for Symptomatic Experiences: A Survey of the Naive Diagnostician

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THE ATTRIBUTION OF CAUSES FOR SYMPTOMATIC EXPERIENCES:

A SURVEY OF THE NAIVE DIAGNOSTICIAN

by

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VITA

The author, James Michael Sinacore, is the son of Roger and Rose (Stillo) Sinacore. He was born June 19, 1952 in Chicago, Illinois. He and his wife Patricia (Ryan) Sinacore were married in Springfield, Illinois on May 30, 1981.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CONTENTS OF APPENDICES

STATEMENT OF THE PROBLEM

The experience of physical symptoms is common to all of us. In fact, it would be difficult to find someone who did not feel some sort of bodily discomfort at least a few times during the year. For example, a poll of Psychology Today readers showed that respondents experienced symptoms such as nasal congestion, sore throat, muscle aches, upset stomach, and lower back pain sometime during the previous year (Rubenstein, 1982). Similarly, a survey of college students by Comstock and Slome (1973) showed that 70% of respondents reported that they experience a headache, a cold, or a sore throat at least once during the academic year. The National Center for Health Statistics (1981) has also reported that of the estimated 1.2 billion office visits to physicians during 1977 and 1978, approximately 18.3 million were for the primary complaint of headache.

From childhood we are taught that physicians are experts at making sense of symptoms, yet we must often diagnose and treat ourselves. It is common, for example, to attribute a headache to stress -- or a stomachache to indigestion. And though these assessments might be periodically correct, the average individual is not making a diagnosis with scientific or professional medical reasoning. Instead, he or she is relying upon a subjective understanding of symptom causality.

If the use of aspirin is thought of as an indirect measure of the extent to which people self-diagnosis, it would appear that there are many individuals who diagnose their own symptoms. For example, a national health survey reported that 23% of adults use aspirin at least once a week, and an additional 52% use it occasionally (NCHS, 1979). That translates into a lot of aspirin taken in an attempt to resolve the symptoms of a lot of different problems.

Even when people decide to seek medical advice, they still might prefer their own diagnostic analysis. For example, it has been reported that 30% to 75% of patients do not adequately comply with treatment that has been prescribed by a physician (Haynes, Taylor, & Sackett, 1979; Sackett & Haynes, 1976). It is not unreasonable to assume that some of these patients are not compliant because they do not believe the doctor's assessment of the problem. In the Psychology Today poll, it was found that nearly a third of respondents said that they have ignored their doctor's orders on at least one occasion in order to treat themselves the way they thought best. In fact, one 40 year old woman expressed her distrust of physicians when she said, "Avoid doctors except when you can't breathe, can't stop the bleeding, can't stand the pain, or need broken bones set" (p.36).

Self-diagnosing can be a risky business, and the consequences can be felt on both the individual and institutional level. On the one hand, people who mistakenly feel that every ache and pain is indicative of a serious condition will place unnecessary strain upon medical and financial resources. On the other hand, people who underestimate the importance of some symptoms can jeopardize their life. As an example, consider the following passage from Hackett and Cassem (1975) that describes an individual who interpreted his symptoms incorrectly, and treated himself for a problem that should have had prompt medical attention.

> A 47 year old man was visiting a city for a business meeting. After a heavy meal he retired to a hotel room and began to experience severe pericardial pain. Immediately, he took two aspirin followed by sodium bicarbonate. The pain did not abate; he began to pace the room and did some sitting-up exercises in an attempt to "bring up the gas." When this was unsuccessful he took a sleeping pill .... Upon his lying down, the pain spread to his left arm and caused him to think he was having an attack of bursitis, a condition he had had in the past. Even though his bursitic pains always had been confined to the shoulder and left arm -- totally unlike the chest pain he was experiencing -- he was able to take comfort

> from his diagnosis and went into a light sleep. About an hour later he was awakened by an increase in the severity of his chest pain. By this time he felt "as though a truck had run over my chest." Until then the thought that he was having a heart attack had not crossed his mind (p.26).

Although this passage is anecdotal, it is representative of many individuals who misdiagnose cardiac symptoms and delay seeking medical help until it is sometimes too late (Greene, Moss & Goldstein, 1974; Gutmann, Pollock, Schmidt & Dudek, 1981; Hackett & Cassem, 1969, 1975; Mathews, Seigel, Kuller, Thompson & Varat, 1983; Olin & Hackett, 1964). Clearly, it would be advantageous to understand how the average person, that is the naive diagnostician, makes causal attributions for symptoms so that events such as these could be minimized in the future.

Currently, there are two symptom attribution models in the literature, both of which have been derived from laboratory studies. These are the <u>hypothesis verification</u> (Skelton & Pennebaker, 1982) and <u>illness prototype</u> (Bishop & Converse, 1986) models. These will be discussed in detail later. However, it is important to note that because these models have been studied under controlled conditions they account for symptom attributions that occur in response to particular stimuli. They are not equipped to describe how attributions are made under more generalized conditions.

To understand the naive diagnostician, research needs to focus upon how people deal with symptoms when they are left to their own devices. In this way, investigators will be able to identify the internal resources (e.g., perceptions, attitudes, knowledge, experience) and external resources (e.g., cues, discussions with friends) that are involved in making symptom attributions. Research at this level has not been done, but it is badly needed if we are to develop our knowledge of symptom attribution processes.

It is a basic fact that there is a paucity of research in this area. Hence, if current models are to be studied within <u>realistic</u> <u>contexts</u> and if new models are to be created, then the scientific community needs to know more about how the average individual makes symptom attributions in his or her own environment. Such information will provide a rich source of data that will be useful for both laboratory and field research.

SIGNIFICANCE OF THE RESEARCH

Throughout the past forty years there has been scientific interest in exploring the ways in which the average individual conceptualizes health and illness. Although psychologists have shown recent interest in this area, much of the research has come from the disciplines of anthropology and sociology. In general, it has been shown that factors such as health beliefs, responses to illness, and health related actions are influenced by one's cultural and social mileu (e.g., see Fox, 1977; Illich, 1974, 1976; Mechanic, 1972; Parsons, 1951, 1972; Paul, 1963; Rosenstock & Kirscht, 1979; Snow, 1974; Zborowski, 1960).

In more recent years, research has focused upon the perception of illness causality (Abrams & Finesinger, 1953; DuCette & Keane, 1984; Lowery, Jacobson, & McCauley, 1987; Lowery, Jacobson, & Murphy, 1983; Rudy, 1980; Taylor & Levin, 1976; Taylor, Lichtman, & Wood, 1984). In addition, a number of authors have been interested in the illness causality perceptions of children, especially in terms of the changes that occur during cognitive development (Bibace & Walsh, 1979; Brodie, 1974; Campbell, 1975a;

Helman, 1978; Koslowsky, Croog & LaVoie, 1978; Mechanic, 1964; Perrin & Gerrity, 1981). This line of research has explored the ways in which individuals understand how various forms of illness are acquired. Some studies with children have examined responses to questions such as "What are measles?," "How does someone get cancer?," "What happens when someone has a heart attack?," and so on. As expected, answers become more complex and conceptual as children progress through Piagetian stages of development. By the time one reaches the stage of formal operations, illness can be thought of as being caused by factors that are psychological as well as physical, and originating in the past as well as the present. Abrams and Finesinger (1953), for example, found that many adult cancer patients attributed their condition to some prior event such as a misdeed, an episode with venereal disease, physical trauma or self-neglect. Likewise, Taylor and Levin (1976) have noted that many women blame their breast cancer on some guilt provoking experience such as premarital sexual activity.

Collectively, these studies attempt to understand the process of what can be called <u>illness</u> attribution; that is, the way in which individuals ascribe causes for the acquisition of physical infirmity. They do not, however, explore mechanisms for symptom attribution; that is, the way in which people ascribe causes for their symptomatic experiences. The former tries to describe how the average person answers questions such as "How did I get cancer?" -- while the latter focuses on questions such as "Why do I have this lump in my breast?".

To date, research on symptom attribution processes is relatively meager. In fact, only a few publications can be found that address this issue directly (Affleck, Pfeiffer, Tennen, & Fifield, 1987; Bishop & Converse, 1986; Cameron & Leventhal, 1988; Campbell, 1975b; Ditto, Jemmott, & Darley, 1988; Dobbins, 1988; Dobbins & Wallston, 1987; Harwood, 1971; Jones, Wiese, Moore, & Haley, 1981; Kosko & Flaskerud, 1987; Lau & Hartman, 1983; Leventhal, Nerenz & Straus, 1982; Locker, 1981; Pennebaker, 1980, Skelton & Pennebaker, 1982; Smith & Kane, 1970).

In the existing literature there are two symptom attribution models. In the hypothesis verification model, Skelton and Pennebaker (1982) posit that ill feelings are similar to other types of sensations in that they are diffuse and undifferentiated levels of arousal (cf. Schachter, 1964; Schachter & Singer, 1962). When someone experiences an unpleasant or ill sensation, Skelton and

Pennebaker (1982) argue that the individual forms a hypothesis about its cause. Following this, there is a search for supporting evidence. For example, someone who feels "queasy" might adopt the hypothesis that he or she has caught the flu. Given this, there would be a search for flu-related clues such as a runny nose, an upset stomach, fever, and so on. A confirmation of these signs would be support for the hypothesis.

Although this model has not been tested directly, Skelton and Pennebaker (1982) provide support for its validity by citing findings from sensation and symptom perception research. In one study, Burnam and Pennebaker (1977) asked subjects to rate the extent to which they were experiencing 12 common physical symptoms after having either run in place or walked in place for two minutes. Subjects were asked to rate a combination of symptoms that could typically be associated with flu (e.g., upset stomach, headache, nasal congestion) and physical exertion (e.g., racing heart, shortness of breath). In addition, the experimenter casually mentioned to half of the subjects -- "As you know, this is the time of the year when we are surrounded by cold and flu producing viruses, and many people aren't feeling well" (Skelton & Pennebaker, 1982, p. 109). The results showed that that the exercise symptoms were rated significantly higher than the flu symptoms for the individuals who ran in place. Ratings, however, did not differ for those who walked in place. Moreover, when subjects' systolic blood pressure was partialled out, it was found that ratings for the flu symptoms exceeded the ratings of the exercise symptoms for those subjects who were exposed to the flu suggestion. Skelton and Pennebaker (1982) argue that the suggestion aided subjects' selective monitoring of flu-related symptoms, especially when they were experiencing a diffuse arousal (created by walking in place for a short while).

In another study, Anderson and Pennebaker (1980) demonstrated that pleasure and pain can function as alternative interpretations of the same sensory experience, depending upon expectations. In this study, subjects signed a bogus consent form that described the sensations that they might experience during the experiment. In the pain interpretation group, the consent form noted that subjects would come into contact with a stimulus which has been found to produce a degree of pain. In the pleasure interpretation group, the word "pain" was replaced with "pleasure." And in the no interpretation group, no reference to the experience of pain or pleasure was made. After signing the consent form, subjects placed their middle finger on a small, vibrating emery board for one second.

Subjects rated their experience on a 13-point scale where negative scores indicated degrees of pain, and positive scores indicated degrees of pleasure. Zero was the neutral point, indicating neither pain nor pleasure. In result, it was found that mean ratings were -1.00, +1.01, and +0.13 for the pain, pleasure, and no interpretation groups, respectively. Differences among these ratings were statistically significant and consistent with expectation manipulations. Interviews with subjects revealed that no one thought that their experience could have been perceived differently from the way it was perceived. In other words, subjects in the pain interpretation group believed that the stimulus could not have been perceived as being pleasurable, and the subjects in the pleasure interpretation group thought that the stimulus could not have been interpreted as being painful. It would appear, then, that expectations affected the way in which a sensation was perceived. As such, perceptions confirmed expectations. Skelton and Pennebaker (1982) believe that people search for symptoms in a similar way to confirm hypotheses about the causes of ill feelings.

In a fundamentally different approach, Bishop and

Converse (1986) have examined how individuals make symptom attributions in terms of <u>illness prototypes.</u> Their work is similar to that of Cantor and Mischel (1977, 1979a, 1979b) who have applied the prototype concept to the area of person perception.

In their experiment, Bishop and Converse (1986) gave subjects 12 short scenarios that described hypothetical individuals who were discussing their symptomatic experiences with a friend. Although each scenario contained six symptoms, the experimenters varied the number of symptoms that were prototypical of a particular target illness. Prototypical symptoms were derived from pretest research.

In high prototype scenarios, all six symptoms were prototypical of the target illness. In medium prototype scenarios, four symptoms were prototypical and two were not. In low prototype scenarios, two symptoms were prototypical and four were not. In addition, three scenarios were constructed in which no two symptoms were related to any particular illness or disease. These were called random scenarios.

Subjects were asked to read each scenario and then rate (on a 7-point scale) the extent to which the symptoms therein were indicative of a particular illness. If subjects thought that the scenario indicated an illness, they were to identify it. Subjects were also asked to rate how confident they were about their illness identification.

Overall, the results showed that subjects' illness ratings varied reliably as a function of the number of prototypical symptoms in the scenarios. The mean ratings were 5.17, 4.25, 3.84, and 3.53 for the high, medium, low, and random prototype scenarios, respectively. In addition, it was found that subjects made disease identifications for an average of 68% of the high prototype scenarios while averaging 45%, 32%, and 34% of the medium, low, and random prototype scenarios, respectively. Moreover, the extent to which subjects' illness identifications matched the implied target illness was also related to the number of prototypical symptoms. Subjects made "correct" or related identifications 64% of the time for high prototype scenarios, while doing so 30% and 16% of the time for medium and low prototype scenarios, respectively.

It was also found that confidence about illness identification varied as a function of the number of prototypical symptoms. Mean ratings were 5.21, 3.84, 3.26, and 3.55 for the high, medium, low, and random prototype scenarios, respectively. This would indicate that subjects felt less confident about their illness identifications as the number of prototypical symptoms diminished.

Conclusion

Although the hypothesis verification and illness prototype models provide insight for understanding symptom attributions, they have limitations. For example, it would appear that the former is inadequate for explaining symptom attributions in the absence of emotional sensation. According to Skelton and Pennebaker (1982), it is an ill feeling that triggers the attribution process. As such, they do not provide a way for predicting how someone would try to determine the cause of sensationless symptoms such as hair loss, vision changes, painless lumps, and skin discolorations. Similarly, the work by Bishop and Converse (1986) does not describe how symptom attributions are made when prototype processing is not possible. This would probably occur in instances where someone experiences a single or unfamiliar symptom.

It is important that research be focused upon symptom attributions as they occur in one's natural environment. It is this type of research that will uncover the behaviors and cognitive mechanisms that are most commonly employed by the average individual when ascribing causes to symptoms.

RELATED LITERATURE

The research by Skelton and Pennebaker (1982) and Bishop and Converse (1986) has begun to explore ways in which symptom attributions are made. The former have stressed the importance of ill feelings, hypothesis formation, and symptom searching, while the latter have focused upon illness prototype information processing. It should be kept in mind, however, that interest in this topic is very recent. There is only one article on illness prototypes, and the hypothesis verification model has not even been tested directly.

Because the knowledge in his area is so limited, there is ample opportunity for considering the utility of other social psychological constructs. Therefore, this section will summarize research which suggests that causal schemas (cf. Kelley, 1972), the availability heuristic (cf. Tversky & Kahneman, 1973, 1974), and environmental cues (cf. Schachter, 1964; Schachter & Singer, 1962) might be involved in symptom attribution processes. Moreover, this section will also present constructs such as expectancy/ outcome incongruity (cf. Pyszczynski & Greenberg, 1981), persuasion (cf. Storms & Nisbett, 1970), and attribution perseverance (cf. Ross, Lepper & Hubbard, 1975) in terms of their ability to promote or inhibit symptom reattributions.

Symptom Causal Schemas

Beliefs regarding the connection between symptoms and their causes is not new. It is known, for example, that the Assyrians of 1000 B.C. recited an incantation against a worm that they believed to cause toothaches (Sagan, 1980). Similarly, the medical term "influenza" has its origin in early Italian culture which linked illness to the stars -- astral influences (Sagan, 1980). In modern day society it would be rare to find someone who believes that aches and pains are the outcome of gingival worms or celestial entities. However, it is easy to see that families, teachers, books, friends, and the media imbue us with contemporary beliefs regarding the causes of symptoms. Mothers, for example, tell their children that they will get a sore throat or the sniffles if they get their feet wet. Popular magazines describe the ways in which stress makes one feel. High school health educators inform students of the outcomes of poor hygiene practices. In all, we are surrounded by a society that values knowing the relation between symptoms and their causes.

Although the term "causal schema" has not directly been used in the symptom literature, the recognition of the concept is evident. The work by Leventhal and associates (Leventhal, Meyer, & Nerenz, 1980; Leventhal & Nerenz, 1982; Leventhal, Nerenz, & Straus, 1980), for example, has shown that an explanation for one's symptom is a basic component of the commonsense representation of illness; that is, the way in which the average individual thinks about illness. In addition, other authors have identified the importance of interpreting one's symptoms as a part of the decision to seek or not seek medical attention (Green et al., 1974; Gutmann et al.,1981; Hackett & Cassem, 1969; Hackett, Cassem, & Raker, 1973; Mathews et al., 1983; Safer, Tharps, Jackson, & Leventhal, 1979; Suchman, 1965)

Research on the connections between specific symptoms and their perceived causes has received little attention, yet there are a few noteworthy findings. For example, Baumann and Leventhal (1985) studied the beliefs of a nonpatient sample regarding the symptoms of elevated blood pressure. They found that individuals believed that changes in blood pressure could be detected by symptoms such as a flushed face, light-headedness, headache, and heart palpitations. Similarly, Pennebaker and Watson

(1988) found that subjects believed that symptoms of sweaty hands, tense stomach, fast pulse, warm or hot body, and headache correlate significantly with blood pressure levels.

In other studies, investigators have noted that causal schemas (although not using this term) can interfere with an accurate assessment of a symptom, thus placing the individual at risk. It is known, for example, that many heart attack patients wait long periods of time before seeking medical help. From interviews with these patients it has been found that many individuals do not realize that their early symptoms are indicative of a cardiac problem. For example, Olin and Hackett (1964) reported that nearly half of the patients in their study believed that a painful chest discomfort was caused by indigestion or ulcers. Another 22% thought that they had a lung problem, leaving just below a third (31%) who thought about cardiac causes.

In instances where cardiac patients do not have severe pain, chest symptoms can appear to be gastro-intestinal in nature. Thus, if someone believes that their symptom is caused by something innocuous, there will not be a perceived need to seek medical help. In result, one will extend the time between symptom onset and the realization that medical attention is necessary. This, in fact, has been reported in a study by Hackett and Cassem (1969) who found that patients took significantly less time getting to the hospital if they thought that their symptom was cardiac related.

The availability of causes. It is suggested here that causal schemas provide a link between symptoms and their supposed causes. However, it would be simplistic to assume that the naive diagnostician tries to make a symptom attribution by considering every plausible cause. It is more likely that one calls to mind what he or she perceives to be the most likely reasons for the symptom (cf. Rodin, 1978). For example, when a young and healthy individual has a headache, causes such as stress, eye-strain or sinus congestion will probably be considered before causes such as high blood pressure or brain tumors. Even though someone will recognize that all of these causes are possible, only the former tend to be common among young, healthy individuals.

This highlights an important aspect of making symptom attributions. That is, the naive diagnostician probably considers the most available causes first. Such an action is based upon what Tversky and Kahneman (1973, 1974) have termed the availability heuristic. This is an implicit cognitive rule that leads one to estimate the probability of an event by how easily instances or occurrences can be brought to mind. Use of this heuristic does not mean that individuals will not consider causes that are less remote; they just won't consider them initially.

Finding empirical support for the availability heuristic in the symptom perception literature is extremely difficult. In fact, only one article appears to present findings that could be interpreted in terms of this construct.

Meyer, Leventhal, and Gutmann (1985) examined commonsense models of hypertension among individuals who were diagnosed with that condition. During an interview, subjects were asked if they could tell when their blood pressure was elevated. In brief, it was found that the longer people were diagnosed with hypertension, the more they were likely to believe that they could detect pressure changes by a specific symptom. Although it is currently believed that people cannot tell when their blood pressure is high (Isselbacher, Adams, Braunwald, Petersdorf, & Wilson, 1980), it would appear that hypertension became increasingly more available to explain particular symptoms over time.

It is expected that the availability of causes can be based upon a number of factors. Blacks, for example, are probably more likely to think of sickle cell anemia than are Caucasians. The menstrual cycle is an easily available cause for some symptoms in women. And to coal miners, black lung disease is likely to be one of the first causes considered when faced with respiratory problems. Hence, health status, sex, race, and occupation are some of the factors that can affect the availability of causes.

Causal cues. If causal schemas present connections between symptoms and their perceived causes, how does one make an attribution when there could be a variety of plausible explanations for a symptom? One possible mechanism is that the naive diagnostician makes use of causal cues that are found in the environment or recalled from memory. In essence, environmental cues can be construed as observations that aid in selecting a cause from a causal schema. For example, someone might be led to attribute their intestinal upset to the flu upon hearing a weather reporter say that "The flu season is upon us" (cf. Burnam & Pennebaker, 1977). Assuming that the flu is already one of the perceived causes for the symptom, the reporter's statement acts as a clue, guiding the selection of that cause.

In addition to observations, people can be induced to make attributions based upon suggestions from others. For example, someone who is experiencing stomach pain might come to believe that he is having an attack of appendicitis based upon a home diagnosis made by a friend or relative. In general, then, environmental causal cues can be thought of as external sources of information that raise the probability of selecting one particular perceived cause over others.

Memory causal cues can also be influential in selecting a cause for a symptom. Memories of family members suffering or dying from particular ailments, or recollections of prior experiences with a symptom can be instrumental in making an attribution. A young women, for example, whose mother died from cancer will no doubt be prone to think of this disease if she were to observe an unusual lump. The memory of her mother's ordeal might be strong enough to direct her in selecting cancer as a cause for any symptom where this disease is a possibility.

A recent study was conducted by Cameron and Leventhal (1988) that demonstrates the influence of environmental cues upon symptom attributions. In their study, college undergraduates were asked to imagine that they were experiencing a set of physical symptoms on the following day. Participants read one of three sets of symptoms. These were: (1) an ambiguous set of six symptoms that had been previously rated by undergraduates as being strongly related to both illness and stress; (2) six mononucleosis symptoms; and (3) six diabetes symptoms. The participants were then asked to make an open-ended interpretation of the symptoms. After that, they were asked to rate the extent to which the symptoms could be due to stress and to an illness. For half of the participants, the following day was Saturday. For the other half, the following day was a day on which a midterm examination was scheduled. It was the investigators' belief that the midterm examination would act as an environmental stress cue, thus influencing individuals to attribute the hypothetical symptoms to stress.

In line with expectations, Cameron and Leventhal (1988) found that when the stress cue was present, 73.5% of the participants mentioned a stress theme in their open ended response. When the stress cue was absent, only 34.5% of the individuals mentioned a stress theme. In addition, participants provided higher stress ratings for the symptoms when the stress cue was present, and lower stress ratings when the cue was absent.

Cue competition. Due to the sheer volume of information that impinges upon someone throughout the day, it is possible that the naive diagnostician can encounter two or more causal cues. For example, someone with a headache might realize that he or she is worried about an impending tax audit (a causal cue for stress) and has recently been trying to catch up with a substantial amount of professional reading (a causal cue for eyestrain). These cues suggest different causes for the same symptom, and thus can be thought of as being in competition. If it is assumed that someone will attempt to make a singular attribution at any one time, then cue competition needs to be resolved.

Resolution of cue competition can be accomplished in a number of ways. Sex differences, for example, might bias individuals into giving preference to cues that indicate different types of causes. For example, in studying cancer patients' adaptation to a dry colostomy[1], Sutherland, Orbach, Dyk and Bard (1952) found that men tended to attribute accidental spillage to dietary indiscretions while women tended to identify emotional upsets.

Individual differences can also predispose people to bias their attention to or from certain types of cues. For example, individuals who are high on self monitoring

(Snyder, 1979) or field dependence (Witkin, 1959) might be prone to consider environmental cues over memory cues because they have a tendency to be vigilant for external information. Similarly, individuals whose fear is easily aroused might tend to avoid cues that point to a cause that provokes anxiety such as cancer or heart trouble.

Recent research by Ditto, Jemmott, and Darley (1988) suggests that individuals, in general, might be inclined to ignore causal cues that indicate the presence of a serious disease or illness. In their study, college students were led to believe that they either exhibited or did not exhibit a "thioamine acetylase" (TAA) deficiency from a bogus saliva test that was conducted in the laboratory. Everyone was told that the TAA test was recently developed to identify individuals who are susceptible to a variety of pancreatic disorders. Results showed that the participants in the deficiency-present group displayed a lower sense of illness threat than those in the deficiency-absent group. In particular, the individuals in the former group felt that the TAA test had a greater false-positive rate, and that TAA deficiency was less life-threatening. The authors concluded that when people are faced with the threat of an illness, they attempt to reduce that threat by minimizing its seriousness. Hence, it is possible that when individuals are faced with multiple causal cues, they might intuitively ignore the cues that suggest the presence of a serious illness.

Another way of resolving cue competition is through salience. A cue becomes salient if it in some way is more noticeable than another. By this, it stands out in the foreground and becomes more available for use. Other researchers (e.g., McArthur & Post, 1977; Taylor & Fiske, 1975) have manipulated salience and found it to affect attribution processes in other contexts.

Resolution of cue competition through salience might provide an explanation for some of the findings in studies that have examined symptomatic experiences. Tonks, Rack and Rose (1968), for example, reported that women were less likely to commit suicide during the week prior to menstruation if they had experienced premenstrual symptoms. This was explained by noting that women tend to attribute their symptoms to bodily changes during this time. As such, this prevents them from focusing upon environmental factors such as hostility from others or stressful situational demands to explain feelings of depression and/or irritability.

In the same vein, Rodin (1976) found that under conditions of high test anxiety, women who were experiencing strong menstrual symptoms performed significantly better on a test than others who were not menstruating. She reasoned that symptomatic women did better because they could attribute an externally produced distress (test anxiety and fear of shock) to their own bodily changes. Non-menstruating women did not have the opportunity to make such an attribution for their similar sense of discomfort. Hence, in both studies it is possible that women's menstrual cycle cues were more salient than stress or anxiety cues, thus affecting attributions for their symptoms.

Another example of cue salience can be found in the studies that have examined the reactions of medical students to the highly stressful and exhausting aspects of their professional training. It has been reported that about 70% of these students exhibit a form of hypochondriasis known as medical students' disease (Hunter, Lohrenz, & Schwartzman, 1964; Woods, Natterson, & Silverman, 1966). Characteristically, the stress imposed by medical education creates chronic physiological arousal which often precipitates identifiable symptoms such as heart palpitations. In reaction, some students make an attribution for their symptom that is similar to the diagnosis of some recently seen patient or clinical anecdote. Although it would be expected that medical students' disease should decrease over the time of training, Woods, Natterson, and Silverman (1966) found that it was observed with almost equal frequency throughout the four years of medical school.

Keeping in line with the notion of cue salience, medical students' disease is not that surprising. Although much of their symptomatology seems to be caused by stress, these students might find disease cues more salient out of the intense encounter with infirmity, both on the wards and in text books.

Promoting Symptom Reattribution

Expectancy/outcome incongruity. In studying the commonsense models of illness, Leventhal and his associates (Leventhal, Meyer, & Nerenz, 1980; Leventhal & Nerenz, 1982; Meyer, Leventhal, & Gutmann, 1985) have asked patients with hypertension, cancer, and serious coronary problems to discuss the subjective understanding of their illness. In addition, Lau and Hartman (1983) have taken a somewhat similar approach toward typical, less severe types of sickness. Overall, it has been found that the common sense representation of illness possesses five basic components: (1) determining the nature of one's problem (i.e., making a symptom attribution), (2) estimating the short- and long-term effects of the problem, (3) estimating the temporal course of the problem, (4) determining the factors that led to the onset of the problem (i.e., an illness attribution), and (5) determining how one goes about recovering from the problem.

The second and third components of this model suggest that individuals have expectations about their perceived health problem. For example, if someone attributes a watery nasal discharge to a head cold, he or she will probably recognize the problem as being harmless, and expect to have this symptom for three or four days. If, on the other hand, it is believed that the flu is causing the symptom, one might expect to eventually be "laid up" for a couple of days with additional symptoms such as body aches and chills. Hence, expectations about future outcomes and experiences naturally follow from a symptom attribution.

There might be instances, however, when an expected course of events does not match what really happens. For example, a person might attribute his symptoms to a head cold and then find himself confronted with nausea and vomiting. Likewise, someone might feel that he is coming down with the flu, only to discover that his symptoms abate as soon as he leaves work. Hence, it is expected that the incongruity between one's attributional expectations and the observed course of events will stimulate a reattribution. Moreover, the unexpected actions and sensations will provide the individual with information that will guide him or her in making a reattribution.

The work of Pyszczynski and Greenberg (1981) has demonstrated that attributional processes are instigated when expectancies are disconfirmed. In their experiment, subjects were asked to observe and form an impression of another subject (really a confederate) in the context of what they believed was a study on "getting acquainted." Subjects were led to believe that the confederate would either agree or refuse to do a favor for the experimenter. During the study, the confederate either agreed or refused to do the favor, thus confirming or disconfirming subjects' expectations.

Later, subjects were given the opportunity to choose and examine the answers to any five questions on a 10 item questionnaire that was purported to have been completed by the confederate at an earlier time. Unknown to the subjects, the bogus questionnaire was made up of five "helping-relevant" items and five "interesting" items.

The former were perceived by a pretest sample to be useful in understanding why someone would either agree or refuse to do a favor for an experimenter in a psychology study. The latter questions were perceived as being interesting things to discover about someone upon an initial meeting.

In essence, the results showed that subjects chose more helping-relevant items when expectancies were disconfirmed. Pyszczynski and Greenberg (1981) argue that the incongruity between expectations and outcomes instigated attributional processing, and this was evidenced in the type of questions that were selected. In a similar way, it is expected that individuals will be instigated to make a reattribution for their symptom when outcomes do not match the expectancies that are based upon an initial attribution.

The tendency to make a reattribution in the face of expectancy/outcome incongruity can also be understood in terms of cognitive dissonance. Carlsmith and Aronson (1963) have argued that dissonance is aroused when an event occurs that disconfirms an expectancy. In essence, one's cognition that an event is expected to occur is dissonant with the cognition that the event did not occur. In result, the true outcome is perceived as unpleasant. This could lead one to reconsider initial expectations.

Persuasion. Another way in which a person can make a reattribution is to be persuaded to do so. Here, persuasion refers to the attempt at having someone accept a new attribution for the same symptomatic experience. It does not mean that one is trying to persuade another into believing in a fallacious cure. Overall, persuasion probably occurs most frequently in the doctor's office.

Much of the research done on persuasion has focused on attitudes and opinions. This is a line of work that was started by Carl Hovland and his associates at Yale University (e.g., see Oskamp, 1977). However, some of that work seems applicable in the context of symptom attributions. For example, in studying the effects of a persuasive communication it has been repeatedly found that a message from a high credibility source produces more attitude change than one from a low credibility source (see Insko, 1967 for a review). This finding would suggest that people will be more likely to make a reattribution if persuaded by a credible individual. Obviously, health professionals, especially doctors, have this credential. It is they who can persuade one to believe that a stomach pain is being caused by an ulcer, not "nerves" as one might have initially expected.

In addition to source credibility, a person's level of persuasibility might also influence the degree to which they can be influenced in accepting a new attribution. Someone who is high in persuasibility might change an attribution at the suggestion of almost anyone. Those who are low in persuasibility might require a credible source before making such a change.

A study that demonstrates symptom reattribution through persuasion was done by Storms and Nisbett (1970) with insomniacs. It has been known since the mid 1960's that when trying to fall asleep, insomniacs experience high levels of autonomic arousal. Frequently, they complain of symptoms such as accelerated heart rate, increased body temperature, racing thoughts and sweating. These authors have argued that insomniacs tend to exacerbate their condition with pejorative self inferences. That is, they believe that their sleep problem is caused by internal factors that are out of control.

In the Storms and Nisbett (1970) study, participants with sleep disturbances were recruited for a dream research project. Some were informed that a pill (really a placebo) they had to ingest prior to retiring would have the effect of increasing their level of arousal. In essence, these subjects were told that their familiar bedtime symptoms would be caused by some other outside factor (persuasion). Another group of similar subjects was told that the pill would lower their level of arousal and relax them (a fallacious cure).

It was expected that subjects in the first group would be able to reattribute their sensations to an external source, thus making them less anxious about their inability to sleep. It was predicted that these subjects would fall asleep in less time than usual. It was also expected that subjects in the second group would not have an external source to attribute presleep sensations. As such, their emotional discomfort should be escalated because they would be experiencing symptoms in lieu of expected tranquilization. Here it was predicted that subjects would be kept awake longer than usual.

The results of the study confirmed these predictions. Subjects in the first group reported decreased sleep onset latencies of about twelve minutes. The other subjects reported increased latencies of about fifteen minutes. It would appear, then, that people can be persuaded to consider another cause for their symptom after an initial attribution has been made.

Inhibiting Symptom Reattribution

Expectancy/outcome congruity. Up to this point, the discussion has been focused upon processes that could promote or enhance reattribution. It is possible, however, that once the naive diagnostician has identified a cause, he or she might be subject to factors or conditions that will *inhibit* a reattribution. In other words, there might be situations in which one could be led to maintain an initial attribution.

It was noted earlier that the research findings of Pyszczynski and Greenberg (1981) indicated that disconfirmed expectancies about a confederate's behavior led to a greater amount of attributional processing by subjects. This, however, was contrasted by the finding that *confirmed* expectancies led to *less* (if any) attributional processing. The authors found a highly significant expectancy-by-behavior crossed interaction. Pyszczynski and Greenberg (1981) suggest that the observation of expected outcomes inhibits (or at least does not promote) attributional processing because the expectancy acts as a pre-existing explanation for the observation. Hence, it would appear that there is no intuitive need to engage in causal reasoning when expectancies are confirmed.

This finding has been evidenced in other studies that have examined the relationship between attribution and expectancies (Jones & Harris, 1967; Jones, Worchel, Goethals & Grumet, 1971; Rosenfield & Stephan, 1977). For example, Jones et al. (1971) told subjects that another student on campus either favored or opposed marijuana legislation. Subjects then read an essay by this student that either favored or opposed marijuana legislation. Half the subjects were told that the student was forced into writing the essay, while the other half was told that the student freely chose to write the essay. In result, it was found that the degree of choice did not influence subjects' attributions when there was congruity between the nature of the student's position (i.e., the expectancy) and the nature of the essay discussion.

Given these research findings, it could be reasoned that when the expectancies based upon an attribution are congruent with outcomes, the naive diagnostician will not desire to make a reattribution. Hence, if someone attributes nasal congestion to the flu and soon afterwards experiences a fever with muscle aches, there would be no reason to assume that another cause is operating.

Attribution perseveration. There is some research which indicates that individuals have a tendency to maintain an attribution even if they are informed that the attribution is erroneous (Ross, Lepper & Hubbard, 1975; Ross, Lepper, Strack and Steinmetz, 1977). For example, Ross et al. (1975) conducted a study in which success and failure on an experimental task was manipulated. Even though subjects were informed later that their performance was controlled by the experimenter, successful subjects continued to believe that they had higher task abilities with respect to those who had failed. Rodin (1978) has noted that attribution perseveration is thought to be an information processing phenomenon. It would appear that once information (i.e., an attribution) is coded, it becomes independent of the original coding scheme. Hence, the information is no longer affected by that scheme or any other information.

In a related study, Ross et al. (1977) asked subjects to read a case history of someone who had psychological problems. They were then asked to imagine that this person either committed suicide or made a financial contribution to the Peace Corps. Subjects were also asked to create an explanation for this event. After this, subjects rated the likelihood of these events actually happening for the person in the case history. In result, it was found that subjects who envisioned and explained suicide perceived this event to be more likely in comparison to those who thought about the Peace Corps contribution. Likewise, those who imagined and explained the contribution saw it as being more likely than those who thought about suicide. Hence, these results suggest that merely thinking about an event raises the subjective probability of its reality.

If it is true that individuals have a tendency to maintain an attribution, then it would be reasonable to assume that the naive diagnostician will naturally <u>not</u> want to make a symptom reattribution. As such, he or she would give attention to attribution-relevant experiences, and ignore signs and symptoms that indicate the possibility of other causes.

Conclusion

In this presentation, it has been argued that little is known about symptom attribution processes. Although there are two explanatory models in the literature, both have been generated from laboratory research and do not necessarily describe how individuals make symptom attributions on a day-to-day basis. If the thoughts and actions of the naive diagnostician are to be understood, research needs to focus upon how individuals make symptom attributions in their natural environment. This will identify basic facts that can be used for future research, both theoretical and applied -- in the laboratory and in the field.

Both symptom attribution models have been described in this presentation. However, other social psychological constructs such as causal schemas, the availability heuristic, and causal cues have been discussed in terms of their relevance to the naive diagnostician. In addition, processes that might promote reattributions (i.e., expectancy/outcome incongruity and persuasion) as well as inhibit reattributions (i.e., expectancy/outcome congruity and attribution perseverance) have been offered.

Conceivably, these constructs could be integrated into a model that represents a symptom attribution process. The present research, however, was not approached with a model as the starting point. Using the above constructs as a guide, data were collected with the intent of constructing a symptom attribution model as the endpoint of the study. It was felt that this would be more beneficial for gaining insight into the true nature of the naive diagnostician.

THE PRESENT RESEARCH INVESTIGATION

The present investigation was organized into two parts. In Study 1, subjects were asked to identify causes for each of five common symptoms. The purpose of this was to undertake a detailed analysis of the number and type of causes that were generated. This was done to learn basic facts about symptom attributions before time and resources were devoted to an investigation of actual self-diagnosis.

The major focus of Study 2 was to examine the attributional activity of individuals who encountered a real symptom. Within the context of a survey, subjects were asked to describe thoughts and actions that occurred throughout the course of a recent symptomatic experience. Most importantly, they were asked to identify the causes or self-diagnoses that came to mind during that time.

The organization of the survey was based upon the assumption that a symptom attribution is initially formed with the aid of informational cues and is then affected by a diversity of subsequent experience. As such, one's initial attribution is likely to be strengthened or weakened by the information and experiences that occur over time. This implies that the naive diagnostician is influenced by easily attainable information. Given the lack of professional training, it is presumed that he or she is unable to effectively distinguish medically relevant from medically irrelevant data. Hence, almost any kind of information could be useful. This would not seem to be an efficacious method of self-diagnosis; however, it is probably the best that one can generally do.

Sources of information such as lay conferral, the perception of being sick, medical guides, health professionals, and the outcome of self-treatment were examined in terms of their potential for strengthening or weakening the belief in one's symptom attribution. It was predicted that when beliefs are strengthened, people will be likely to maintain their attributions. When belief in one's attribution is weakened, it was predicted that he or she will be prone to make a reattribution, one that is consistent with new information.

Each of the above sources is discussed in more detail later. However, the data analysis for Study 2 sought to answer two basic questions: (1) to what extent do individuals encounter information from the above sources, and (2) to what extent to they promote and inhibit the tendency to make a symptom reattribution?

College students were used for both studies. Although an older group of individuals might have a more diverse experience with symptomatology, it was expected that college students would be equally inclined to make symptom attributions. College students have been used in other health and symptom perception studies with success (e.g., see Bishop & Converse, 1986; Cameron & Leventhal, 1988; Comstock & Slome, 1973; Cox, 1983; Krantz, Baum & Wideman, 1980; Lau, 1982; Lau & Hartman, 1983; Moos & van Dort, 1977; Pennebaker, 1982; Pennebaker, Burnam, Schaeffler & Harper, 1977; Pennebaker & Skelton, 1981; Pennebaker & Watson, 1988; Peterson, 1986; Weinstein, 1982). Moreover, the principal investigator has collected symptom attribution data from college students in the past and has found that meaningful responses were obtained.

METHOD FOR STUDY 1

Subjects

The subjects for this study were 35 introductory psychology students who received course credit for their participation. The demographic characteristics of these individuals are displayed in Table 1. As it can be seen, the subjects were predominately female, Caucasian, freshmen who were enrolled in non-health oriented curricula. No one was a trained health professional. The mean age of subjects was 18.46 years (SD = 1.12).

Instruments

All participants completed two short instruments that were affixed together in a questionnaire labeled "SYMPTOM SURVEY" (see Appendix A). The first was a demographic data sheet that collected basic information about the responder. The form asked individuals to identify their gender, age, racial affiliation, grade point average[2], and position at the University. The data sheet also asked responders if they were enrolled in a health professions curriculum or were a practicing health professional.

Table 1

Demographic Characteristics of the Subjects in Study 1

Characteristic	Frequency[a]	Relative Frequency
Gender		
Male	10	.29
Female	25	.71
Racial Affiliation		
Caucasian	23	.66
Black	2	.06
Hispanic	1	.03
Oriental / Asian	8	.23
Other	1	.03
Student Rank		
Freshman	26	.74
Sophomore	4	.11
Junior	4	.11
Senior	1	.03

(*table continues*)

Characteristic	Frequency[a]	Relative Frequency
Curriculum		
Health Professions	6	.17
Other	29	.83

[a]N = 35.

The second instrument asked subjects to identify what they believed to be the causes for a set of five common symptoms: headache, watery eyes, congested nose, upset stomach, and sore throat. These symptoms were chosen because they were found to be the most frequently experienced by a group of college students who were surveyed at an earlier time. In an effort to control for presentation effects, the five symptoms were presented in random order to each subject (cf. Underwood, 1966).

For each symptom, participants were asked to list all of the causes that came to mind. They were informed that there were no right or wrong answers on the task, and were provided with 15 spaces upon which answers could be written. In addition, there was a note on the bottom of each page that told the participant to use the backside of the paper if needed.

Procedure

The subjects who volunteered for this study met collectively at a designated time and place. At the beginning of the session, the experimenter welcomed everyone and announced that the purpose of the study was to ask a group of individuals to identify what they believed to be the causes for a set of symptoms. The experimenter emphasized that there were no right or wrong answers on this task, and that it was important to write down anything that came to mind. It was also announced that there was no time limit for the task; participants could take as much time as needed. At that point, everyone was given a copy of the Symptom Survey to complete.

Research Questions and Data Analysis

There were three main questions that guided the data analysis for Study 1. These questions are listed below with the procedures that were used to answer them.

Question 1: WHAT TYPES OF CAUSES WERE IDENTIFIED BY SUBJECTS?

To answer this question, the perceived causes for each of the five symptoms (N = 911) were copied onto individual index cards. These cards were separated according to symptom type and were then sorted into piles in order to identify themes of responses. From this, categories were developed for each of the five symptoms. Subjects' perceived causes were then classified and tallied.

The categories of perceived causes (N = 64) were then classified according to the dimensions of locus, stability, and controllability. These are three dimensions that have been posited by Weiner (1979) to underlie causal attributions (also see Russell, 1982). This was done in order to examine the <u>nature</u> of the perceived causes that were identified by subjects. For example, if individuals tended to list causes that were forms of illness or were serious in nature, it was presumed that most of the categories would be classified as internal, stable, and uncontrollable (e.g., a brain tumor). On the other hand, if perceived causes tended to be transient or innocuous influences, then it would be expected that most of the categories would be classified as external, unstable, and controllable (e.g., stress).

Classifying the causes of symptoms with Weiner's (1979) dimensions posed some difficulties. After all, his tripartite scheme was originally proposed to codify the causes of <u>behavior</u>, not physical symptoms. However, other investigators such as Dobbins (1988), and Dobbins and Wallston (1987) have been successful in studying arthritis patients' perceptions of their conditions in terms of the related dimensions of internality, stability, and globality.[3] Thus it was felt that Weiner's scheme could be used for the present study if appropriate and careful criteria were established.

The dimension of locus was one of the most difficult to classify. This is because most causes appeared to have both an internal and external nature. For example, a flu virus originates outside one's body, yet it has to be internalized before one begins to feel symptoms of the flu. Thus, if subjects report that the flu is a possible cause for a congested nose, should this be classified as internal or external? To confuse matters even more, it would seem that any cause would have to be internalized to some degree before it could have an effect upon an individual. Does this then suggest that all causes should be classified as internal? As it can be seen, the development of classification criteria was necessary.

In response to the difficulties posed by this task, the following criteria were used. A cause was considered EXTERNAL if it referred to an observable physical influence (i.e., an event, entity, or activity) that is outside one's body and is present at the time a symptom appears or shortly before it appears. A cause was considered INTERNAL if it referred to an influence that takes place primarily within the body before or while a symptom is perceived. Thus, if one were considering a headache, causes such as loud noises, hot weather, and noxious fumes would be classified as external; while fatigue, eye strain, and an allergy would be classified as internal.

A cause was considered STABLE if it referred to an influence that is relatively permanent or has the nature of lasting for a considerable period of time. A cause was considered UNSTABLE if it referred to an influence that is short-lived or temporary in nature. Thus, an allergy and a brain tumor would be classified as stable causes for a headache; while a cold, stress, and overexertion would be classified as unstable.

A cause was considered CONTROLLABLE if one could potentially prevent the cause from happening, or if one could alleviate a symptom by affecting the cause without the need of professional medical help.[4] Causes that did not meet at least one of these two criteria were considered UNCONTROLLABLE. Hence, a hangover, fatigue, and eye strain would be classified as controllable causes of a headache; while a brain tumor and an allergy would be classified as uncontrollable.

After the categories of perceived causes were classified in terms of locus, stability and controllability, the occurrences of the levels of each dimension were tallied and compared with one-way chi-square tests.

Question 2: DOES THE NUMBER OF PERCEIVED CAUSES VARY AS A FUNCTION OF SYMPTOM TYPE?

To answer this question, participants received an enumeration score for each of the five symptoms. This score was operationally defined as the number of perceived causes that were listed. However, enumeration was construed as a measure of the extent to which someone could imagine or think of possible causes for a symptom. In other words, the enumeration score was viewed as the degree to which causes of symptoms "come to mind."

It was expected that enumeration scores would vary among the symptoms because peoples' experiences with symptoms vary. For example, some symptoms (an upset stomach) occur more frequently than others (a nose bleed).[5] Likewise, some symptoms (a headache) are discussed frequently and receive a high degree of media attention, while others (an ear ache) are hardly ever the object of discussion or the focus of a highly publicized health report. As such, it is possible that peoples' variable experience with symptoms might lead them to think about more possible causes for one symptom over another.

The enumeration scores were used in a repeated measures analysis of variance to test the null hypothesis that the tendency to think of possible causes did not vary among the five symptoms in the study. A Student-Neuman-Keuls post-hoc analysis (cf. Winer, 1971) was chosen to be used if the result of the ANOVA was statistically significant.

Question 3: HOW MUCH OF THE VARIANCE IN THE ENUMERATION SCORES FOR A SYMPTOM IS EXPLAINED BY THE VARIANCE IN DEMOGRAPHIC VARIABLES AS WELL AS THE VARIANCE IN THE ENUMERATION SCORES FOR THE OTHER SYMPTOMS?

To answer this question, hierarchical linear multiple regression analyses (cf. Cohen & Cohen, 1975) were conducted. There were five analyses - one for each of the symptoms in Study 1. All the analyses were conducted in two steps. On step 1, a set of demographic variables was entered as the first component of the regression equation. The set consisted of age, gender, and two dummy variables that reflected racial affiliation (Caucasian vs. non-Caucasian) and curriculum (health professions vs. other).[6] On step 2, a single score was entered. This was the average of the enumeration scores for the four other symptoms.[7] Thus, when the variance in enumeration scores for a headache was being explained, the enumeration scores for watery eyes, congested nose, upset stomach, and sore throat were averaged and entered on step 2 of the analysis.

It was reasonable to assume that demographic characteristics would be related to attribution processes. Other studies have found that college students experience symptoms as a function of their year in school (Comstock & Slome, 1973; Greenly & Mechanic, 1976; Moos & Van Dort, 1977). Moreover, Pennebaker et al. (1977) found that female college students tend to be more symptomatic than males over time. As such, it is possible that demographic variables might also be related to symptom attribution processes.

It was difficult to predict how the average enumeration score for step 2 of the regression analysis would behave. However, if there is a consistency in the way that causes for symptoms come to mind, it would be expected that this score would correlate directly and reliably with the criterion score in each regression equation.

RESULTS FOR STUDY 1

The Perceived Causes for Five Symptoms (Question 1)

Types of perceived causes. The categories of perceived causes for each of the five symptoms are listed in Tables 2 through 6. Overall, these tables share three basic findings.

First, subjects identified a variety of attributions for each of the symptoms. In all, 64 categories of perceived causes were identified. Eleven to 15 categories were found to be associated with each of the symptoms.

Second, each table shows considerable variation in terms of the number of individuals who mentioned a particular cause. It can be seen that there are some causes that were identified by most everyone, and some that were mentioned by only a few. As an example, Table 2 shows that stress was identified as a possible cause for a headache by nearly three quarters of the subjects, while noxious fumes was mentioned by only four individuals.

Figure 1 examines the variability for each of the five symptoms by displaying the proportions of subjects who mentioned a particular cause. The abscissa identifies perceived causes in generic order (i.e., first, second,

Table 2

The Perceived Causes for a Headache

Category of Perceived Cause	Frequency[a]	Relative Frequency
Stress/tension[b]	26	.74
Fatigue[b]	19	.54
Emotional distress[b]	18	.51
A cold[b]	16	.46
Loud noises	13	.37
Head injury	13	.37
An illness[b]	12	.34
Lack of food	12	.34
Alcohol/drugs[b]	11	.31
Overexertion[b]	10	.29
Eye strain[b]	9	.26
Problem with head organs	8	.23
Hot/cold weather[b]	6	.17
Allergy[b]	5	.14
Noxious fumes/smoke[b]	4	.11

[a]N= 35. [b]A perceived cause that is identified with at least one other symptom.

Table 3

The Perceived Causes for Watery Eyes

Category of Perceived Cause	Frequency[a]	Relative Frequency
Particle in the eye	26	.74
Smoke/fumes[b]	22	.63
Emotions[b]	19	.54
Allergy[b]	19	.54
Contact lenses	16	.46
Fatigue[b]	14	.40
A cold[b]	12	.34
Eye trauma	10	.29
Eye illness (e.g., infection)	8	.23
Eye strain[b]	8	.23
Illness (other)	6	.17
Liquid irritants (e.g., chlorinated water)	5	.14
Drugs/alcohol[b]	4	.11

[a]N= 35. [b]A perceived cause that is identified with at least one other symptom.

Table 4

The Perceived Causes for a Congested Nose

Category of Perceived Cause	Frequency[a]	Relative Frequency
A cold[b]	34	.97
Allergy[b]	18	.51
Weather (e.g., dry air, cold)[b]	10	.29
Flu[b]	8	.23
Crying/worrying	7	.20
Respiratory problem (e.g., sinusitus)	6	.17
Drugs/alcohol[b]	4	.11
Foreign object in nose	4	.11
Covered or blocked nostrils	4	.11
Fatigue[b]	2	.06
Not caring for oneself properly (e.g., not dressing for the weather)[b]	2	.06

[a]N= 35. [b]A perceived cause that is identified with at least one other symptom.

Table 5

The Perceived Causes for an Upset Stomach

Category of Perceived Cause	Frequency[a]	Relative Frequency
Eating/drinking too much	29	.83
Junk/spicy food	19	.54
Emotional distress[b]	19	.54
Spoiled/bad food	17	.49
Not eating	15	.43
Flu[b]	14	.40
GI[c] illness (e.g., ulcer)	10	.29
Stress[b]	10	.29
Overexertion/activity[b]	7	.20
Gastrointestinal irregularity (e.g., indigestion)	7	.20
Illness other than GI[b]	6	.17
Menstruation	4	.11
Bad odors	3	.09
Punched in the stomach	2	.06

[a]N= 35. [b]A perceived cause that is identified with at least one other symptom. [c]Gastrointestinal.

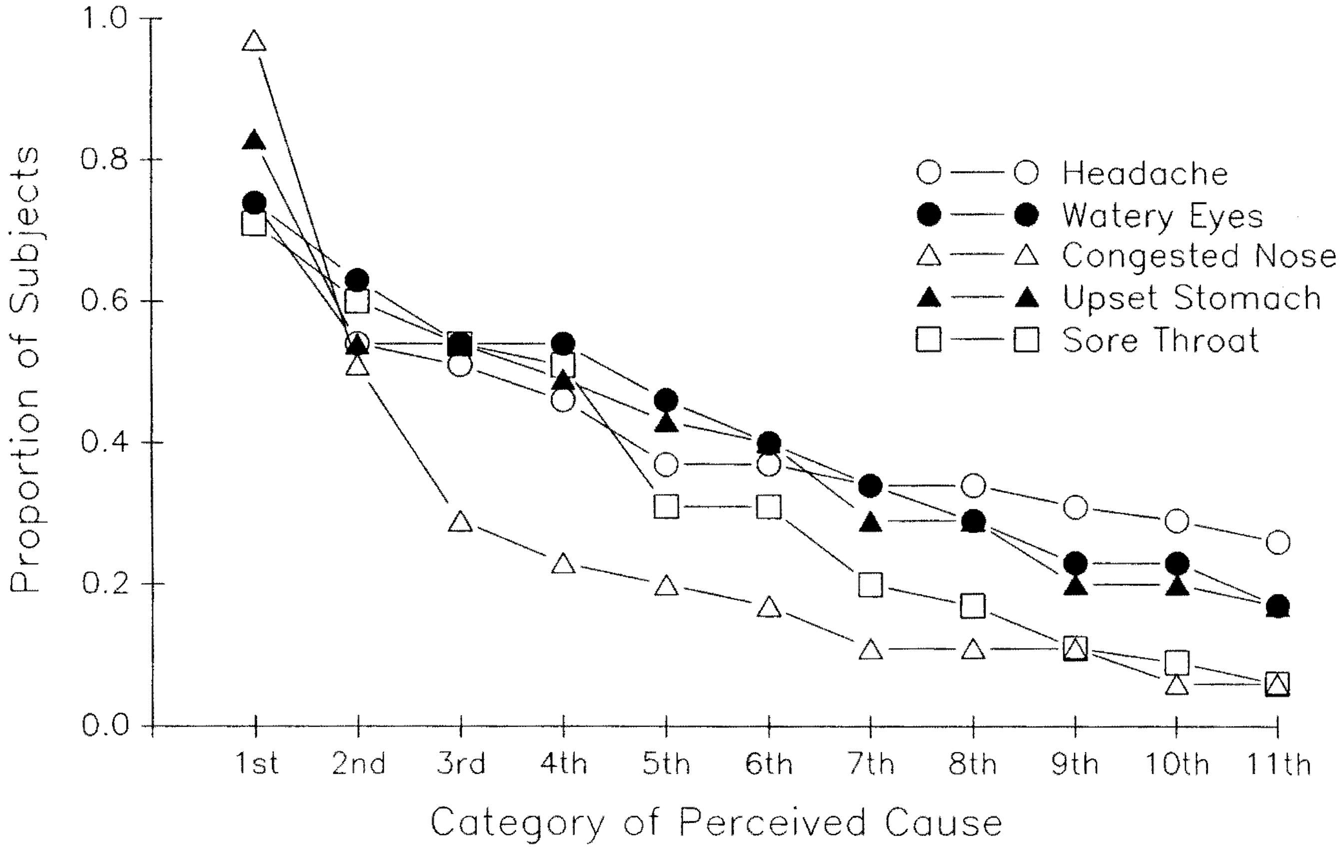
Table 6

The Perceived Causes for a Sore Throat

Category of Perceived Cause	Frequency[a]	Relative Frequency
A cold[b]	25	.71
Infection (e.g., tonsillitis)	21	.60
Vocal Strain	19	.54
Throat irritation (e.g., hot foods)	18	.51
Illness (other)[b]	11	.31
Cold/rainy weather[b]	11	.31
Not caring for oneself properly (e.g., not dressing for the weather)[b]	7	.20
Poor diet	6	.17
Emotions[b]	4	.11
Allergy[b]	3	.09
Fatigue[b]	2	.06

[a]N= 35. [b]A perceived cause that is identified with at least one other symptom.

Figure 1. Proportion of Subjects in the First Eleven Categories of Perceived Causes in Tables 2–6



third, etc.). This refers to the order of the first eleven causes as they are listed in Tables 2-6. Most of the plots in Figure 1 show a comparable pattern. However, the plot for a congested nose shows that almost everyone mentioned the first cause (a cold) and that the proportions of subjects mentioning subsequent causes are notably lower than that of the other symptoms. This indicates that some symptoms are associated with a major or predominant cause. It is not clear why this happens, but it might be related to peoples' limited experience with certain symptoms or to the fact that some symptoms have a limited number of real causes.

The third basic finding is that Tables 2 through 6 show that a substantial proportion of the perceived causes are shared, to some degree, among the five symptoms. On average, it was found that 59% of the perceived causes for any one symptom were identified with at least one other symptom. For example, stress was mentioned as a possible cause for a headache as well as an upset stomach. An allergy was identified as a potential cause for a headache, sore throat, watery eyes, and a congested nose. In all, there were 13 perceived causes that were associated with two or more symptoms; these were stress, fatigue, emotions, alcohol/drugs, hot/cold weather, an allergy, flu, an "illness," a cold, not caring for oneself properly, overexertion, eyestrain, and fumes/smoke.

Dimensionality of perceived causes. Table 7 displays the frequency distributions of the dimensions of locus, stability, and controllability for the perceived causes of all five symptoms. For this table, however, it should be noted that only single occurrences of a cause were used for analysis. As such, the 13 symptom attributions that are mentioned above were accounted for only once. Thus of the 64 perceived causes that are listed in Tables 2 through 6, only 39 were used for the analyses in Table 7 (i.e., 25 causes were second, third, or fourth occurrences). Hence, the analyses examined the causal dimensions for a set of unique perceived causes.

Overall, the chi-square analyses indicate that subjects identified causes that are predominately internal, unstable, and controllable. This means that there was a tendency to think of relatively harmless or manageable types of causes for the symptoms that were presented. Tables 2 through 6 show that many of the listings are common, everyday types of events or occurrences.

Among the three causal dimensions, locus and controllability showed the least response tendency. The

Table 7

Frequency Distributions of the Dimensions of Locus, Stability, and Controllability for the Perceived Causes of the Five Symptoms in Study 1

Dimension	Frequency	Relative Frequency	Chi-Square Value	*p*
Locus				
External	13	.33	4.333	.0374
Internal	26	.66		
Stability				
Stable	6	.15	18.692	<.0001
Unstable	33	.85		
Controllability				
Controllable	27	.69	5.769	.0163
Uncontrollable	12	.31		

Note: For each analysis, df= 1 and N= 39. The null hypothesis for these and other one-way chi-square analyses was that category frequencies were statistically equivalent.

ratio of internal:external and controllable:uncontrollable perceived causes were 2:1 and 2.25:1, respectively. In contrast, however, the ratio of unstable:stable perceived causes was 5.5:1. These results indicate that subjects showed a response tendency on all three causal dimensions, but it was substantially more pronounced for the dimension of stability.

Enumeration as a Function of Symptom Type (Question 2)

The results of the repeated measures analysis of variance and post-hoc test on the enumeration data are displayed in Table 8.[8] The ANOVA suggests that the mean enumeration scores for an upset stomach, watery eyes, and headache are equivalent. Subjects provided statistically lower enumeration scores for a congested nose and sore throat.

Explaining Enumeration Variance (Question 3)

The results of the linear multiple regression analyses on the enumeration scores for the five symptoms are depicted in Tables 9 through 18. It should be noted that the analysis for each symptom occupies two tables in order to account for the two steps of the hierarchical multiple regression. For example, the results of the

Table 8

ANOVA Summary Table and Post-Hoc Analysis of the Mean Enumeration Scores for the Five Symptoms in Study 1

Source of Variation	SS	DF	MS	F	P
Symptom Type	223.337	4	55.834	21.581	<.0005
Within Cell	351.863	136	2.587		

Congested Nose	Sore Throat	Upset Stomach	Watery Eyes	Headache
3.37[a]	4.46	<u>5.83</u>	<u>5.91</u>	<u>6.46</u>[b]
(1.63)	(2.21)	(2.33)	(2.42)	(2.03)

[a]The means and (standard deviations) of the enumeration scores. [b]The means of the underlined symptoms do not differ statistically.

Table 9

Step 1 of the Multiple Regression Analysis of the Enumeration Scores for a Headache

MULTIPLE R	.378
R^2	.143
ADJUSTED R^2	.029
STANDARD ERROR	2.005

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	4	20.091	5.023	1.250	.3114
RESIDUAL	30	120.594	4.020		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	1.519	.934	.286	1.626	.1144
GN	.876	.760	.197	1.153	.2582
RA	.174	.727	.041	.239	.8125
AGE	-.089	.313	-.049	-.285	.7780
(A)	6.226	6.073		1.025	.3134

Table 10

Step 2 of the Multiple Regression Analysis of the Enumeration Scores for a Headache

MULTIPLE R	.534		
R^2	.285	R^2 CHANGE	.142
ADJUSTED R^2	.162		
STANDARD ERROR	1.863		

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	5	40.087	8.017	2.311	.0696
RESIDUAL	29	100.599	3.469		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	.809	.917	.152	.882	.3851
GN	.787	.707	.177	1.113	.2749
RA	.087	.676	.021	.129	.8981
AGE	-.010	.293	-.005	-.033	.9735
MEAN[a]	.488	.203	.406	2.401	.0230
(A)	2.704	5.829		.464	.6461

[a]Mean of enumeration scores for symptoms other than headache.

Table 11

Step 1 of the Multiple Regression Analysis of the Enumeration Scores for Watery Eyes

MULTIPLE R	.482
R^2	.232
ADJUSTED R^2	.130
STANDARD ERROR	2.255

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	4	46.161	11.540	2.269	.0851
RESIDUAL	30	152.582	5.086		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	2.558	1.051	.405	2.434	.0211
GN	.647	.855	.123	.756	.4554
RA	.490	.817	.098	.599	.5534
AGE	-.291	.353	-.135	-.826	.4151
(A)	9.423	6.831		1.380	.1779

Table 12

Step 2 of the Multiple Regression Analysis of the Enumeration Scores for Watery Eyes

MULTIPLE R	.728		
R^2	.530	R^2 CHANGE	.298
ADJUSTED R^2	.449		
STANDARD ERROR	1.794		

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	5	105.368	21.074	6.545	.0003
RESIDUAL	29	93.375	3.220		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	1.460	.874	.231	1.670	.1058
GN	.426	.682	.081	.624	.5372
RA	.400	.651	.080	.614	.5438
AGE	-.188	.282	-.087	-.669	.5087
MEAN[a]	.919	.214	.580	4.288	.0002
(A)	3.530	5.606		.630	.5339

[a]Mean of enumeration scores for symptoms *other* than watery eyes.

Table 13

Step 1 of the Multiple Regression Analysis of the Enumeration Scores for a Congested Nose

MULTIPLE R	.289
R^2	.084
ADJUSTED R^2	-.039
STANDARD ERROR	1.660

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	4	7.516	1.879	.682	.6099
RESIDUAL	30	82.655	2.755		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	1.045	.773	.245	1.351	.1868
GN	-.221	.629	-.062	-.351	.7277
RA	-.295	.602	-.087	-.491	.6269
AGE	.198	.260	.136	.763	.4513
(A)	.110	5.027		.022	.9827

Table 14

Step 2 of the Multiple Regression Analysis of the Enumeration Scores for a Congested Nose

MULTIPLE R	.637			
R^2	.406		R^2 CHANGE	.322
ADJUSTED R^2	.303			
STANDARD ERROR	1.360			

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	5	36.571	7.314	3.957	.0074
RESIDUAL	29	53.600	1.848		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	.110	.676	.026	.163	.8718
GN	-.493	.520	-.139	-.948	.3512
RA	-.470	.495	-.139	-.951	.3494
AGE	.337	.215	.232	1.566	.1282
MEAN[a]	.594	.150	.631	3.965	.0004
(A)	-5.085	4.321		-1.177	.2488

[a]Mean of enumeration scores for symptoms other than congested nose.

Table 15

Step 1 of the Multiple Regression Analysis of the Enumeration Scores for an Upset Stomach

MULTIPLE R	.408
R^2	.166
ADJUSTED R^2	.055
STANDARD ERROR	2.267

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	4	30.784	7.696	1.497	.2279
RESIDUAL	30	154.187	5.140		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	1.672	1.056	.274	1.583	.1239
GN	.429	.860	.084	.498	.6218
RA	.769	.822	.159	.936	.3569
AGE	-.414	.354	-.199	-1.167	.2522
(A)	11.940	6.867		1.739	.0923

Table 16

Step 2 of the Multiple Regression Analysis of the Enumeration Scores for an Upset Stomach

MULTIPLE R	.589		
R^2	.347	R^2 CHANGE	.180
ADJUSTED R^2	.234		
STANDARD ERROR	2.041		

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	5	64.131	12.826	3.078	.0239
RESIDUAL	29	120.841	4.167		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	.740	1.007	.121	.735	.4684
GN	.235	.777	.046	.302	.7649
RA	.750	.740	.155	1.014	.3191
AGE	-.360	.320	-.173	-1.127	.2692
MEAN[a]	.658	.233	.457	2.829	.0084
(A)	8.131	6.328		1.285	.2090

[a]Mean of enumeration scores for symptoms *other* than upset stomach.

Table 17

Step 1 of the Multiple Regression Analysis of the Enumeration Scores for a Sore Throat

MULTIPLE R	.145
R^2	.021
ADJUSTED R^2	-.109
STANDARD ERROR	2.332

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	4	3.518	.879	.162	.9561
RESIDUAL	30	163.168	5.439		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	.545	1.087	.094	.502	.6193
GN	-.123	.884	-.025	-.139	.8904
RA	-.254	.845	-.055	-.301	.7658
AGE	-.143	.365	-.073	-.393	.6967
(A)	7.389	7.064		1.046	.3039

Table 18

Step 2 of the Multiple Regression Analysis of the Enumeration Scores for a Sore Throat

MULTIPLE R	.733		
R^2	.537	R^2 CHANGE	.516
ADJUSTED R^2	.457		
STANDARD ERROR	1.631		

ANALYSIS OF VARIANCE FOR REGRESSION

	DF	SS	MS	F	P
REGRESSION	5	89.547	17.909	6.733	.0003
RESIDUAL	29	77.139	2.660		

VARIABLES IN THE EQUATION

VARIABLE	B	SE B	BETA	T	P
HPS	-1.416	.834	-.245	-1.697	.1005
GN	-.623	.625	-.129	-.997	.3272
RA	-.582	.594	-.127	-.981	.3349
AGE	.029	.257	.015	.112	.9118
MEAN[a]	1.155	.203	.818	5.687	<.0001
(A)	-.608	5.136		-.118	.9066

[a]Mean of enumeration scores for symptoms other than sore throat.

first and second steps of the regression analysis for headache enumeration scores are displayed in Tables 9 and 10, respectively.

Abbreviations used in the analyses. The regression tables contain abbreviations for almost all variable names in order to maximize use of the available page space. Only the age variable is listed without brevity. The dichotomous variables that describe subjects are: health professions student status (HPS), gender (GN), and racial affiliation (RA). The average of the enumeration scores for symptoms other than the one in the analysis is represented by the term "MEAN." Finally, the parenthetical expression "(A)" represents the intercept of the regression line.

Variance explained by demographic variables. The variance in enumeration scores that is attributable only to demographic characteristics is displayed in Tables 9, 11, 13, 15, and 17. These tables contain the results of the first step of the hierarchical multiple regression analysis for all of the five symptoms.

The analysis of variance for regression for four of the five symptoms suggest that the demographic variables did not account for a significant proportion of the variance in enumeration. Only the analysis for the symptom of watery eyes rendered an _F_ ratio that approached statistical significance (see Table 11). Subjects who were enrolled in a health professions curriculum tended to think of a few more possible causes for this symptom.

These results were also examined from the perspective of the information that is carried by the squared multiple regression coefficients. When the R^2's for all five symptoms were averaged, it was found that the demographic variables accounted for about 13% of the variance in enumeration. Although this appears appreciable, it should be noted that the average adjusted R^2 (which eliminates the incidental inflation of R^2) was reduced to 4%. This coincides with the analysis of variance for regression findings that are described above. Thus overall, the results suggest that the demographic variables did not account for any meaningful variance in enumeration.

Variance explained by other symptoms. The variance in the enumeration scores for one symptom that is attributable to both demographic variables and the enumeration scores of other symptoms is displayed in Tables 10, 12, 14, 16, and 18. These tables contain the results of the second step of the hierarchical multiple regression analysis for all of the five symptoms.

In the upper right hand corner of each table, the change in R^2 from the first to the second step of the analysis is presented. The test of the statistical significance of the increase in explained variance between the steps is presented in the regression table as the *t*-test for the MEAN variable.

This information is important because it describes the proportion of variance in the enumeration scores for one symptom that is uniquely attributable to the enumeration scores of the other symptoms. For example, Table 14 shows that adding the "MEAN" variable to the regression equation explained an additional 32% of the variance in enumeration scores for a congested nose. This is 32% of the variance that is explained after considering the variance that is attributable to demographic characteristics.

To collectively examine the increase in explained variance for all of the five symptoms, the differences in adjusted R^2's for Tables 9 through 18 were computed (i.e., Step 2 - Step 1) and averaged. Overall, it was found that 28% of the variance in the enumeration scores for any one symptom was uniquely attributable to the average of the enumeration scores for the other symptoms. Moreover, the increases in explained variance for all of the five symptoms were statistically reliable beyond the .05 level of significance. These results indicate that the extent to which subjects could generate perceived causes for one symptom was related to their tendency to do so for other symptoms.

Following each of the multiple regressions, a residuals analysis was conducted in order to examine the appropriateness of the linearity assumption. In each case, it was found that the scatterplot of the predicted and residual scores showed no discernible pattern. Moreover, normal probability plots indicated that the residuals possessed an underlying normal distribution. Given these findings, it was felt that the assumption of linearity was not violated.

DISCUSSION FOR STUDY 1

The task that was completed by the participants of Study 1 was simple, yet there are a number of conclusions that can be made about the naive diagnostician. Each of these is discussed below.

MULTIPLE CAUSES ARE ASSOCIATED WITH A SYMPTOM.

One of the initial findings of Study 1 was that subjects were able to generate a number of perceived causes for each of the five symptoms. This is in line with Kelley's (1972, 1973) causal schema theory. Specifically, the results are consistent with the notion of multiple sufficient causes. When considering a particular symptom, subjects were able to think about a number of perceived causes -- each one of which would be sufficient to account for the symptom.

In addition to this, it was found that some of the causes were mentioned by almost everyone, while others were mentioned by only a few. This finding could be explained in terms of Tversky and Kahneman's (1973, 1974) availability heuristic. It is possible that the perceived causes that were mentioned by most of the subjects were those that were commonly and more easily called to mind. Thus, it seems that stress was an easily available cause for a headache, and a cold was an easily available cause for a congested nose.

It would be interesting to see how another group of similar subjects would respond if they were given Tables 2 through 6 and were asked to check the perceived causes that they thought could account for the respective symptoms. If it were found that most of the subjects checked most of the causes, it would lend support for the availability heuristic hypothesis. In other words, this would suggest that when individuals are not required to "think up" causes for a symptom, they are not influenced by the likelihood of certain causes coming to mind.

When people actually diagnose themselves do they think about an array (i.e., a "laundry list") of potential causes for their symptom or do they focus upon a few major possibilities? In either case, do individuals think of the most available causes first or do they make an attribution that is aided by existing information such as situational cues?

Although the present study cannot answer these questions directly, it seems reasonable to think that people do not typically embark upon a "laundry list" or algorithmic type of strategy when making a symptom attribution. Such an approach would require considerable time and cognitive effort. Moreover, it should not be forgotten that the results of the Cameron and Leventhal (1988) study suggest that situational cues are important when ascribing causes to symptoms. If their findings are indicative of what happens in a larger context, there is some data that suggests that people do not use an algorithmic strategy when diagnosing their symptoms. Rather, it seems they are influenced to think about a cause that is related to situational (or other relevant) information.

Clearly, there are no definitive statements that can be made about this matter at present. However, if situational cues are important for ascribing causes to symptoms, it would appear that the availability heuristic does not play a central role in self-diagnosis. It is reasonable to expect that the heuristic would influence peoples' attributions if they had to independently "come up with" a cause for a symptom. But if attributions are guided by cues, then individuals could well be stimulated into thinking about causes which, by themselves, might or might not be easily called to mind.

If the availability heuristic was operating in Study

1, it might have been related to the experimental task. After all, subjects were asked to think about the causes for hypothetical symptoms, they were not actively engaged in the process of self-diagnosis.

THE NAIVE DIAGNOSTICIAN THINKS OF GENERAL CAUSES.

One of the findings from this study is that some of the perceived causes were associated with a majority of the symptoms. In some cases, these causes appear to be related to the cluster of symptoms that were presented. For example, it is easy to see why subjects reported that a cold and an allergy can be causes for a headache, sore throat, watery eyes, and a congested nose. In fact, this is indicative of what Bishop and Converse (1986) have termed illness prototypes. It is likely that this particular group of symptoms are prototypical of a cold or an allergy. It is odd, however, that subjects also reported that fatigue was a potential cause for the same symptoms. It is doubtful that a headache, sore throat, watery eyes, and a congested nose are prototypical of fatigue.

There were four other perceived causes that were identified with three or four symptoms each; these were emotions (distress), alcohol/drugs, hot/cold weather, and an illness. Although this finding is not well established at this point, it nonetheless suggests the interesting idea that the naive diagnostician thinks of general causes. In other words, there are some causes that can account for a variety of seemingly unrelated symptoms. If this is true, individuals would almost always be able to relate their symptom to some cause, even in the absence of contextual cues. General causes could help individuals "think of something" at those times when it is difficult to make a symptom attribution.

The invocation of general causes can be seen in people who live near a toxic waste site. Once they realize that the air or water has been polluted there is a tendency to attribute a variety of symptoms to the presence of the noxious substance. In reality, this might be the cause of <u>some</u> symptoms, but the tendency is to attribute this cause to almost every symptom.

The concept of general causes can provide insight into a collective behavior that is known as hysterical contagion or mass psychogenic illness. This refers to the spreading of a symptom to a group of individuals for which no physical explanation can be found (Colligan, Pennebaker, & Murphy, 1982; Kerckhoff & Back, 1968; Skelton & Pennebaker, 1982).

In a book entitled The June Bug, Kerckhoff and Back (1968) describe a textile company that was forced to close when 40 out of 200 employees in a sewing room became ill, some of whom were hospitalized. The affected workers complained of symptoms such as dizziness, nausea, and profuse sweating. Ultimately, 62 out of a total of 965 employees became ill. During this time there was a rumor in the factory indicating that these problems were being caused by invisible bugs that had arrived in a shipment of raw materials imported from South America. The authors found that individuals believed that the bugs were to blame for their symptoms, despite the fact that there was no confirming evidence.

Following a complex analysis of this case, Kerckhoff and Back (1968) concluded that peoples' symptoms were caused by tension and job stress. From the workers perspective, however, it is possible that the "bugs" became a general cause, thus having the capability to account for most any symptom that was experienced. If the workers did not have the capacity to form general causes, the hysterical contagion might not have occurred.

Although the experience with day-to-day symptoms is typically not this extreme, general causes can still play a significant role. For example, someone who is unable to think of a reason for his or her headache can easily blame stress, the weather, or fatigue. These factors are pervasive in one's life and can be readily drawn upon to account for a variety of symptomatic experiences. The concept of general causes is an intriguing idea, one that is deserving of serious research and development.

INDIVIDUALS THINK OF INNOCUOUS OR MANAGEABLE CAUSES FOR SYMPTOMS.

The results of Study 1 have shown that subjects tended to make attributions that were harmless (e.g., a cold) or manageable by a lay person given some degree of effort (e.g., hot/cold weather). In all, perceived causes were found to be predominately internal, controllable, and unstable in nature.

There are three explanations for this finding. First, it should not be forgotten that the subjects in this study are young and relatively healthy. Many of their symptoms have actually been caused by harmless and manageable influences. Because the five symptoms of Study 1 are typical of those experienced by college students, it is possible that subjects thought of the causes that are typical of their experience.

In a related way, subjects might have thought of simplistic types of causes because they were asked to respond to simplistic types of symptoms. Perhaps responses would have been different if the symptoms were of greater intensity, such as a severe headache or a piercing abdominal pain. If so, it would suggest that self-diagnosis is, in part, a function of symptom severity.

The fact that subjects identified innocuous and manageable causes might also be explained in terms of a motivational bias. It is possible that when making a symptom attribution there is an automatic tendency to think of simple, non-threatening types of causes. In this way, individuals protect themselves from personal threat. This idea is consistent with other investigators who have argued that people exhibit a tendency to discount the importance or seriousness of their symptomatic experiences (e.g., see Ditto et al., 1988; Green et al., 1974).

SYMPTOM ENUMERATION IS RELATED TO SYMPTOM TYPE.

Analyses from Study 1 showed that enumeration scores varied as a function of symptom type. The fact that individuals can think of more causes for some symptoms and less for others might be related to their experience. It was noted earlier that some symptoms are more commonly experienced and are more frequently the focus of media attention. Other symptoms are less frequently experienced and discussed.

It is interesting, however, to consider how enumeration influences the information processing aspects of making a symptom attribution. For example, if self-diagnoses are made independently of situational cues, it seems likely that the time it would take to make an attribution as well as the confidence that one would have in that attribution is a function of enumeration. In other words, it would take longer to make a symptom attribution if there were many perceived causes to consider. Likewise, someone probably would be less sure of his or her attribution because there is a variety of causes that can explain the symptom.

If, however, cues guide the selection of causes, it is possible that enumeration plays a small role in the process of choosing a cause. This is because situational cues (or other relevant information) would provide the individual with a guess or a hunch about the cause that is at work. Hence, it would make no difference if there were few or many causes to explain a symptom -- the cue would implicate some <u>particular</u> cause.

SYMPTOM ENUMERATION MIGHT BE AN INDIVIDUAL DIFFERENCE VARIABLE.

It was interesting to find that the enumeration score for each symptom was positively and reliably correlated with the average of the enumeration scores of the other symptoms. One interpretation of this finding is that enumeration is an individual difference variable. This would suggest that some people have the tendency to think of more causes for symptoms while others tend to think of less. For lack of a better label, these individuals can be said to be high and low on the construct of symptom enumeration.

As an individual difference variable, symptom enumeration could affect self-diagnosis in two distinct ways. First, it might influence one's tendency to make a symptom attribution. In other words, high enumerators might be prone to self-diagnose, even when a symptom is minor and fleeting. And low enumerators might not think of a cause for a symptom, despite the fact that it might last for a considerable period of time. Second, enumeration could influence one's ability to make a symptom reattribution. When confronted with the fact that one's symptom attribution might be incorrect, high enumerators would be better equipped to bring some other cause to mind so that another attribution can be made.

Conclusion

In summary, then, it can be seen that Study 1 has provided an array of interesting results, some of which have nurtured the discussion of general causes and symptom enumeration as an individual difference variable. More importantly, the study has raised just as many questions as it has answered. From this work it is clear that future research needs to examine the role of situational cues, the influence of the availability heuristic, motivational biases and much more. To do this, however, investigators will need to study people as they make attributions for real symptoms. This is the focus of Study 2.

METHOD FOR STUDY 2

Subjects

The subjects for this study were 105 introductory psychology students who received course credit for their participation. An additional 10 subjects were recruited from other psychology courses by means of a flier that asked for volunteers.

The demographic characteristics of all individuals are displayed in Table 19. Similar to Study 1, subjects were predominately female, Caucasian, freshmen who were enrolled in non-health oriented curricula. There were seven individuals who were trained health professionals (all were nurses). The mean age of subjects was 19.66 years (SD = 2.76).

Overall, the subjects from Studies 1 and 2 were quite similar. A comparison of characteristics showed that there were no reliable differences in the relative distributions of gender, X^2 (1, N= 148)= 2.17, p= .141; racial background, X^2(1, N=148)= 1.22, p= .269; student rank, X^2 (2, N= 148)= 4.61, p= .10; and trained health professionals X^2 (1, N= 148)= 2.97, p=.085. However, the subjects in Study 2 were slightly older (19.66 vs. 18.46),

Table 19

Demographic Characteristics of the Subjects in Study 2

Characteristic	Frequency[a]	Relative Frequency
Gender		
Male	48	.43
Female	65	.57
Racial Affiliation		
Caucasian	85	.75
Black	10	.09
Hispanic	9	.08
Oriental / Asian	8	.27
Other	1	.01
Student Rank		
Freshman	66	.59
Sophomore	29	.26
Junior	5	.04
Senior	3	.03
Other	10	.08

(*table continues*)

Characteristic	Frequency	Relative Frequency
Curriculum		
Health Professions	7	.06
Other	106	.94
Health Professional		
Yes	9	.08
No	104	.92

Note: The data from two subjects are missing.

[a]N=113.

$t(146) = 2.50$, $p < .02$. They also had a smaller percentage of individuals (6% vs. 17%) who were enrolled in a health professions curriculum, X^2 (1, $N = 148$) = 4.00, $p < .05$.

Instruments

The subjects of Study 2 were interviewed with the Symptom Attribution Survey (see Appendix B). This instrument was developed for use in the present study and was designed to document a sampling of the cognitions, perceptions, and behaviors of individuals who have thought about the causes for a recent physical symptom. A handout that was used with the survey is located in Appendix C.

Subjects were also required to complete the Health Opinion Survey (Krantz, Baum, & Wideman, 1980), the Pennebaker Inventory of Limbic Languidness (known as the PILL) (Pennebaker, 1982), and the Body Consciousness Questionnaire (Miller, Murphy, & Buss, 1981). These are paper and pencil instruments that assess individual differences on: (1) the preference for information and behavioral involvement in health care, (2) the tendency to experience symptoms, and (3) the public and private aspects of body awareness, respectively. Copies of these instruments are in Appendices D, E, and F.

These paper and pencil instruments were chosen for this study because they assess health related individual differences that could reasonably influence symptom attribution processes. In addition, the instruments were normed on college students and are designed to address routine aspects of health and symptomatology. This was considered most appropriate for the subjects in this study.

Symptom attribution survey. At the beginning of this interview, respondents were asked a few questions about the nature of their symptomatic experience. For example, they were asked to identify their symptom and describe how uncomfortable it was, how long it lasted, and how serious it appeared to be. After this, the respondents were asked to list all of the possible causes that could account for a symptom like the one they had experienced.

At that point, subjects were asked to identify the first cause that came to mind when they experienced their symptom. They were then asked questions regarding information that was acquired from the qualities of the symptom, the outcomes of self-treatment, the interactions with friends or other lay consultants, visits with health professionals, and medical guides. Respondents were asked to freely describe what it was that led them to think about their attribution. They were also asked to freely describe anything that might have informed them that their attribution was wrong. Some of these questions are discussed in more detail later.

If the respondent mentioned that he or she thought about more than one cause during the course of the symptom, the same set of questions was repeated. The interview was designed to ask these questions for up to three perceived causes (i.e., an initial attribution and two reattributions). Only the number and type of attributions were recorded after that point. Many of the analyses for Study 2 were conducted as a function of the three attributions. For the remainder of this work, these are referred to as the primary, secondary, and tertiary attributions.

Health Opinion Survey. This survey is a 16 item instrument that asks respondents to agree or disagree with a series of statements that address the desire for health related information and the interest in being involved with one's own health care. From this, two subscale scores are generated. Krantz et al. (1980) have reported that the behavior and information subscales have internal consistency measures of .74 and .76, respectively. In addition, test-retest reliabilities over a seven week period have been measured at .71 and .59, respectively.

Both the subscale and total scores from the Health Opinion Survey have demonstrated low to moderate correlations (average r= .27) with the Health Locus of Control Scale (cf. Wallston & Wallston, 1982; Wallston, Wallston, Kaplan, & Maides, 1976), and a very low correlation (average r= .08) with social desirability (cf. Crowne & Marlowe, 1964). More importantly, Krantz et al. (1980) have shown that college students who scored high on the behavior subscale showed a greater tendency to make a self-diagnosis in response to a recent physical symptom.

Pennebaker Inventory of Limbic Languidness. The PILL is a 54 item instrument that presents the respondent with a wide variety of common symptoms. Each symptom is rated on a 5-point time continuum that measures the frequency with which the symptom is experienced. One score is generated from this instrument. Pennebaker (1982) has reported that the internal consistency of the PILL is .88, and that the test-retest reliability across a two month period is .79. Unlike other medical checklists, such as the Cornell Medical Index, the PILL focuses upon common symptoms.

Body Consciousness Questionnaire. This instrument contains 15 statements that reflect the perceptions of one's body. The task of the respondent is to rate each statement in terms of how characteristic it is of his or her own perception. The instrument renders three subscale scores; these are private body consciousness (i.e., the awareness of internal sensations), public body consciousness (i.e., concern about the outward appearance of one's body), and body competence (i.e., the belief in the adequacy of one's body).

Miller et al. (1981) have reported that the test-retest reliabilities for the three subscales, in order, are .69, .73, and .83 over a two month period. Moreover, the authors have noted that private body consciousness correlated more strongly with private _self_-consciousness than it did with public _self_-consciousness. The reverse of this was found with public body consciousness (cf. Fenigstein, Scheier, & Buss, 1975).

Procedure

Subjects were invited to volunteer for Study 2 if they had experienced a physical symptom sometime in the previous three to four weeks. They were asked not to volunteer if they had participated in Study 1. On their initial contact with the investigator, each subject was asked to complete a demographic information sheet. Following this, the investigator read the introduction of the Symptom Attribution Survey, and then conducted the interview with the subject.[9] Before departing, subjects were informed that they would be receiving a few questionnaires in the mail. All were informed that full credit for participation in the study was contingent upon returning the questionnaires in the post-paid return envelopes.

Approximately three to five days after the interview, the investigator mailed the self-report instruments. In a cover letter, subjects were informed that everything should be returned within five days and that the forms should be completed in the order that they were received. This was important because the instruments were put in random order to control for presentation effects.

The time interval between tasks was implemented to minimize fatigue (the interview averaged 32.8 minutes), and subject reactivity. During pilot interviews it was noted that some respondents had been concerned about their causal analysis. For example, some people prefaced their answers with qualifiers such as "I know this won't seem very scientific, but ..." It was felt that if the survey created a reactivity, some subjects might want to appear more rational on the self-report instruments, thus biasing the results.

Counterbalancing the tasks between subjects would have been a desirable method for controlling the effects of task presentation (cf. Underwood, 1966). In this case, half of the subjects would complete the interview followed by the self-report instruments, while the other half would do this in reverse order. This, however, would require half of the subjects to postpone the symptom interview. It was felt that Study 2 was already relying enough upon subjects' recollections of a common event. To delay the interview would probably make recall more difficult and prone to additional error.[10]

Research Questions and Data Analysis

There were nine main questions that guided the data analysis for Study 2. These questions are listed below with the procedures that were used to answer them.

Question 1: WHAT TYPES OF SYMPTOMS DID SUBJECTS EXPERIENCE?

To answer this question, verbal reports of symptoms were categorized and tallied. These categories were then organized into higher "systems-oriented" classes. This was done to provide greater structure in reporting the variety of symptoms that was experienced.

Question 2: HOW MANY SUBJECTS MADE A SYMPTOM ATTRIBUTION, AND WHAT TYPES OF ATTRIBUTIONS WERE MADE?

Making an attribution. Attribution researchers such as Hastie (1974), Lau and Russel (1980), Pyzczynski and Greenberg (1981), and Wong and Weiner (1981) have shown how attributional processes are triggered by unexpected events. Physical symptoms can be viewed as unexpected in that they sometimes occur suddenly, and almost always disrupt the way one feels or performs routine activities. In this sense, it would be expected that most individuals make an attribution in response to a symptom.

The number of subjects who made no symptom attribution and those who made at least one attribution were tallied and compared with a one-way chi-square test. It was expected that most of the subjects made at least one attribution for their symptom.

Types of attributions. Using definitions from Study 1, subjects' primary, secondary, and tertiary attributions were classified with the dimensions of locus, stability, and controllability. The occurrences of the levels of these dimensions were then tallied and compared with one-way chi-square tests.

When presented with hypothetical, innocuous types of symptoms, the subjects in Study 1 identified causes that were primarily internal, unstable and controllable. If individuals apply the same attribution processes with real symptoms, it would be expected that similar results would be found with Study 2.

Question 3: WHAT EXPLAINS THE VARIANCE IN ATTRIBUTIONAL EFFORT?

In this study, attributional effort was conceptualized as the degree to which someone tried to diagnose his or her symptom. This was operationally defined as the number of attributions that were made.

The importance of question 3 is based in the fact that many of the analyses for Study 2 were designed to examine cognitions or behaviors as they occurred from the primary to the tertiary attribution. It was thought that attributional effort might be related to factors such as the type or quality of one's symptom or health related individual differences. For example, subjects with a minor symptom might not need to go beyond a primary attribution, while those with a more serious or uncomfortable one might be led to make secondary and tertiary attributions. Likewise, individuals who score high on the construct of private body consciousness might be inclined to make more attributions than those who score low. It would be important to be aware of these factors so that they could be used in the interpretation of other analyses.

To explain the variance in attributional effort, a hierarchical multiple linear regression analysis was conducted. The analysis was organized into four steps. On step 1, eight dummy coded variables representing symptom type were entered into the equation. On step 2, five variables that depict symptom characteristics were entered. These were: duration of the symptom, perceived discomfort, perceived seriousness, and two dichotomous variables that measured whether or not the symptom was previously experienced by the subject and whether or not it interfered with routine activities. On step 3, a single dichotomous variable was entered. This was called <u>attributional response</u>, and represented the time at which one's initial attribution was made (i.e., at the time the symptom appeared or some time later). On Step 4, health-related individual difference variables were entered. These were: private body consciousness, the information and behavior subscales of the Health Opinion Survey, and the PILL. A symptom enumeration score was also entered on this step.[11]

Attributional response was selected because it was viewed as a proxy measure of the need to self-diagnose, that is, the need to know the cause of one's symptom. The selection of this variable was not based upon prior research. Rather, it was a reasonable assumption that if the need to self-diagnose were high, one would begin attributional reasoning at the time of symptom onset. If the need were low, one might not be concerned about an attribution until later. Given this, it seemed reasonable to expect that attributional response would be positively related to attributional effort.

Question 4: WHAT TYPES OF INFORMATION DID SUBJECTS USE FOR MAKING A SYMPTOM ATTRIBUTION?

During the interview, subjects were asked to describe the type or types of information that helped them make a symptom attribution. Responses to this open-ended question were examined, classified and tallied for the primary, secondary, and tertiary attributions. In order to test the adequacy of the classification scheme, the responses for the primary attribution were independently coded by two raters. Agreement was assessed with the kappa statistic (Fleiss, 1973).

Cues from the environment and from one's memory were discussed earlier in terms of their expected value for making symptom attributions. In addition, the Cameron and Leventhal (1988) study has provided empirical support for the influence of environment cues. Hence, it is expected that subjects' responses to the open ended question would reflect the importance of environment and memory cues if they are useful in ascribing causes to symptoms.

Question 5: DID THE OUTCOMES OF SELF-TREATMENT INFLUENCE SUBJECTS' BELIEF IN THEIR ATTRIBUTION, AND DID THIS AFFECT THE TENDENCY TO MAKE A REATTRIBUTION?

Belief in one's attribution. If subjects made an attempt at relieving their symptom, they were asked if the outcome of that action influenced the belief in their attribution. Those respondents who said that their belief was either strengthened or weakened were asked to explain why they felt this had occurred. Responses to this question were examined, classified and tallied for the primary, secondary, and tertiary attributions. The adequacy of the classification scheme was tested by having two independent raters code the responses for the primary attribution. Agreement was then assessed with the kappa statistic.

Making a reattribution. Theories of self-regulation (e.g., see Leventhal & Hirschman, 1982; Leventhal, Nerenz, & Strauss, 1980) show how health-related beliefs are influenced by the outcomes of actions. For example, someone may take a antacid to relieve what is believed to be a case of heartburn, only to find that the discomfort gets worse. As a result, the feedback from this action might lead the individual to re-evaluate his or her symptom attribution. This type of feedback is similar to the notion of expectancy/outcome incongruity which was discussed in terms of its ability to promote attributional processing. Given this, it was felt that individuals would be more inclined to make a symptom reattribution if the belief in their original attribution was weakened following self-treatment outcomes. The reverse would be expected if belief in one's original attribution was strengthened.

To examine this hypothesis, the impact of self-treatment outcomes (i.e., the belief that one's attribution was strengthened, weakened, or unaffected) was cross-referenced with subsequent attribution activity (i.e., the subject either made or did not make a subsequent attribution). The data were then analyzed with a chi-square test for association.

Question 6: DID SUBJECTS SEE THEMSELVES AS BEING SICK, AND DID THIS INFLUENCE THE TENDENCY TO MAKE A REATTRIBUTION?

The perception of being sick. The importance of question 6 lies in the phenomenological interpretation of the term "sick." Although this topic has received little attention in the psychological literature, Baumann (1961) has shown that individuals define sickness using feeling, symptomalogical, and performance dimensions. In other words, people report that being sick means that one does not feel right, one has symptoms, and one is unable to carry on his or her normal activities.[12] Thus, it would appear that being sick means that one is affected by a dispositional type of condition. A condition that is somewhat more than an external, fleeting influence.

Given this, it seems reasonable to assume that the perception of being sick is susceptible to the fundamental attribution error (Jones & Nisbett, 1972). In other words, there might be an automatic assumption that one's symptoms are not indicative of an underlying illness. If this is true, individuals should typically believe that they are not sick -- at least until they exhibit the qualities mentioned above.

Research by Campbell (1975b) supports this notion. In his study, a sample of mothers and their children were given a list of 13 symptoms and were asked if these would be indicators of illness in the mother. They were then asked if the same symptoms would be indicators of illness in the child. In result, it was found that mothers were more likely to attribute illness to their children, and children were more likely to attribute illness to their mothers.

To answer the first part of question 6, the number of subjects who believed that they were sick and those who believed that they were not sick were tallied and compared with one-way chi-square tests. This was done for the primary, secondary and tertiary attributions. Overall, it was expected that most people would see themselves as _not_ being sick.

Making a reattribution. If the perception of being sick means that one believes him- or herself to be affected by something other than an external, fleeting condition, it is reasonable to assume that there will be a resistance to change a symptom attribution. To test this idea, the belief in being (or not being) sick was cross-referenced with subsequent attribution activity. The data were then analyzed with a chi-square test for association. It was expected that those who perceived themselves as being sick would be less inclined to make a reattribution.

Question 7: DID DISCUSSIONS WITH FRIENDS OR OTHER LAY CONSULTANTS INFLUENCE SUBJECTS' BELIEF IN THEIR ATTRIBUTION, AND DID THIS AFFECT THE TENDENCY TO MAKE A REATTRIBUTION?

Discussing symptoms with lay consultants. Medical sociologists have been aware of "lay referral structures" (Friedson, 1961) or "lay conferral systems" (Elder, 1968) for nearly three decades. These have been described as the informal network of friends and acquaintances who provide medically relevant information to each other. Research findings suggest that a substantial proportion of individuals make use of lay consultants when faced with symptoms. For example, Suchman (1965), Miller (1973) and Sanders (1982) found that medically uninformed individuals were sought by 74%, 62%, and 81% of their samples, respectively. The work by Sanders is particularly relevant here because it is based upon a group of college undergraduates.

The impetus for lay conferral is thought to be based in social comparison processes (Sanders, 1982). Thus, it would be expected that the greater one's uncertainty in the interpretation of a symptom (such as when it is unusually intense or uncomfortable), the greater his or her tendency will be to seek lay consultation. Moreover, social comparison theory (Festinger, 1954; West & Wicklund, 1980) predicts that individuals will seek people who are most like themselves.

During the interview of Study 2, subjects were asked if they had discussed their symptoms with a friend or other lay consultant.[13] If so, respondents were asked to identify this person. In addition, they were asked if they <u>specifically intended</u> to discuss the symptom, and if the lay consultant made an attribution for their symptom during the discussion. If the lay consultant made a similar attribution, the subject was asked if this made him or her feel more confident about the attribution. If the lay consultant made a contrary attribution, the subject was asked if this made him or her feel less confident about the attribution.

If the lay consultant did not make an attribution during the discussion, the subject was asked if there was anything said that <u>in some way</u> made him or her feel more or less confident about the attribution. Open ended responses were recorded for this last question.

Subjects' responses to each of the above questions were tallied and compared with one-way chi-square tests. This was done for the primary, secondary, and tertiary attributions. In addition, the open ended responses were examined, classified and tallied. The adequacy of the classification scheme was tested by having two independent raters code the responses for the primary attribution. Agreement was then assessed with the kappa statistic.

In order to examine a motive for seeking lay consultation, subjects' rating of perceived discomfort and seriousness were correlated with the intent to discuss their symptom (1= intended to discuss symptom, 0= did not intend to discuss symptom).

Given the subjects in this study it was expected that most would have discussed their symptom with one or two friends. Although it was difficult to predict if people <u>intended</u> to discuss their symptom, it was hypothesized that subjects' confidence in their attribution would would be higher if the lay consultant made a similar symptom attribution. Based upon social comparison theory it was also hypothesized that the ratings of discomfort and seriousness would correlate positively with the intent to discuss one's symptom.

Making a reattribution. To date, the literature on the influence of lay referral is not consistent. For example, Sanders (1982) describes the value of lay consultation for making decisions about the meaning of symptoms. In addition, he found that college undergraduates reported that the advice of a lay consultant typically has a strong directive influence on reactions to symptoms. The work by Miller (1973), however, found that individuals showed equal tendencies to accept and to reject lay advice regarding actions for cancer symptoms of the head and neck.

To investigate the influence of lay referral on reattribution, the strength of subjects' belief in their attribution following the discussion with a friend (i.e., the belief was strengthened, weakened, or unaffected) was cross-referenced with subsequent attribution activity. The data were then analyzed with a chi-square test for association. If the belief in one's initial attribution was weakened by the discussion, it would be expected that individuals would tend to make a reattribution. The reverse would be expected if one's belief was strengthened.

Question 8: DID SUBJECTS RELY UPON HEALTH PROFESSIONALS OR MEDICAL GUIDES TO HELP THEM MAKE A SYMPTOM ATTRIBUTION?[14]

Not much is known about the health care seeking behavior of college undergraduates; however, there are some data to suggest that they are not high consumers of health care practice. It was noted earlier that the National Center for Health Statistics (1981) reported that there were about 18.3 million office visits during 1977-78 for the primary complaint of headache. Of that total, only 2.5 million visits (13.6%) were made by individuals 15-24 years of age.[15] The only age group that showed a lower percentage of office visits was that under 15 years old. In a similar vein, Sanders' (1982) survey of undergraduates found that a health care professional was sought to explain symptoms about once every 14 months. Given this, it was reasonable to expect that most of the subjects in Study 2 did not seek a health professional to aid in the diagnosis of their symptom. Likewise, it was expected that most did not refer to a medical guide.

To answer question 8, the number of individuals who sought professional help for their symptom and those who did not were tallied and compared with a one-way chi-square test. The same was done for those who referred to a medical guide and those who did not. Both sets of analyses were conducted for the primary, secondary and tertiary attributions.

Question 9: WHAT TYPES OF INFORMATION DID SUBJECTS ENCOUNTER THAT CAST DOUBT UPON THEIR SYMPTOM ATTRIBUTION, AND DID THIS AFFECT THE TENDENCY TO MAKE A REATTRIBUTION?

Types of doubt provoking information. During the interview, subjects were asked if there was any information that made them think that their attribution might be wrong. If so, they were asked to describe what this was. An open ended response was desired so that the survey could assess facts that had not already been covered. These responses were examined, classified and tallied for the primary, secondary, and tertiary attributions. In order to test the adequacy of the classification scheme, the responses for the primary attribution were independently coded by two raters. Agreement was then assessed with the kappa statistic.

Persuasion and expectancy/outcome incongruity were discussed earlier in terms of their potential influence for stimulating a symptom reattribution. Hence, it was expected that subjects' open ended responses would reflect these influences if they are important for making a reattribution.

Making a reattribution. It was expected that the presence of doubt provoking information would stimulate a reattribution. In other words, people should be prone to make a reattribution if they perceive information that makes them think that their initial attribution might be wrong. To test this hypothesis, the belief that doubt provoking information was present or absent was cross-referenced with subsequent attribution activity. These data were then analyzed with a chi-square test for association.

RESULTS FOR STUDY 2

Symptoms Experienced By Subjects (Question 1)

The types of symptoms that were experienced by subjects are presented in Table 20. As it can be seen, many of the individuals (66%) had an experience with a headache or a variety of gastrointestinal problems. Across all symptoms, however, subjects reported a wide range of discomfort and perceived seriousness. The discomfort ratings ranged from 3 to 10 (*M*= 6.97, *SD*= 1.65), where the values of 1 and 10 indicate "very little discomfort" and "a lot of discomfort," respectively. Similarly, the seriousness ratings ranged from 1 to 10 (*M*= 4.43, *SD*= 2.31), where these indicate that one's symptom was perceived to be "not very serious" and "very serious," respectively. In terms of duration, the shortest symptom lasted about one hour, while the longest lasted 22 weeks (*M*= 1.52 weeks, *SD*= 3.26 weeks *MD*= 2.65 days).[16] Almost all of the subjects (85%) said that their symptom interfered with routine activities to some extent.

Table 20

Symptoms Experienced by the Subjects in Study 2

Symptom Type	Frequency[a]	Relative Frequency
Headache (alone or with other symptoms)	51	.44
Gastrointestinal (stomach ache, nausea, diarrhea, upset stomach with and without other symptoms, multiple gastrointestinal symptoms)	25	.22
Musculoskeletal (muscle aches, sore back, joint pain)	10	.09

(*table continues*)

Symptom Type	Frequency	Relative Frequency
Upper Respiratory (Sore throat, cough, multiple upper respiratory symptoms)	7	.06
Genitourinary (urinary frequency, burning)	4	.04
Ear Problems (burning, trauma)	3	.03
Skin Rash	2	.02
Other Singular Symptoms	8	.07
Other Multiple Symptoms	5	.04

[a]N= 115.

Attributional Activity and Types of Attributions Made (Question 2)

Making an attribution. Of the 115 subjects in this study, 112 made at least one attribution for their symptom, X^2 (1, N= 115)= 103.31, p< .00005. The mean number of attributions was 2.09 (SD= 1.26), and 63% of the subjects made two or more.

Types of attributions. Tables 21, 22, and 23 display the frequency distributions of the dimensions of locus, stability, and controllability for the primary, secondary, and tertiary attributions. The data show that subjects reported causes that were predominately internal, unstable, and controllable. When averaged across the three tables, the ratios of internal:external, unstable: stable, and controllable:uncontrollable perceived causes were found to be 2.08:1, 5.64:1, and 1.77:1, respectively.

These ratios were re-computed for the 33 subjects who made all three attributions. This was done to insure that the findings in Tables 21-23 were not due to the attrition of subjects (note how N drops from 112 to 72 to 33). When averaged across all three attributions, the ratios were, in order, 2.48:1, 5.05:1, and 1.75:1. The levels of statistical significance were very similar to those in Tables 21-23.

Table 21

Frequency Distributions for the Dimensions of Locus, Stability, and Controllability for Primary Attributions

Dimension	Frequency	Relative Frequency	Chi-Square Value	*p*
Locus				
Internal	76	.68	14.29	<.0005
External	36	.32		
Stability				
Stable	12	.11	69.14	<.0005
Unstable	100	.89		
Controllability				
Controllable	75	.67	12.89	<.0005
Uncontrollable	37	.33		

Note: For each analysis, df= 1, N= 112.

Table 22

Frequency Distributions for the Dimensions of Locus, Stability, and Controllability for Secondary Attributions

Dimension	Frequency	Relative Frequency	Chi-Square Value	*p*
Locus				
Internal	47	.65	6.72	.01
External	25	.35		
Stability				
Stable	10	.14	37.56	<.0005
Unstable	62	.86		
Controllability				
Controllable	46	.64	5.56	.02
Uncontrollable	26	.36		

Note: For each analysis, df= 1, N= 72.

Table 23

Frequency Distributions for the Dimensions of Locus, Stability, and Controllability for Tertiary Attributions

Dimension	Frequency	Relative Frequency	Chi-Square Value	*p*
Locus				
Internal	23	.70	5.12	.02
External	10	.30		
Stability				
Stable	10	.30	5.12	.02
Unstable	23	.70		
Controllability				
Controllable	18	.55	0.27	.60
Uncontrollable	15	.45		

Note: For each analysis, df= 1, N= 33.

In addition to the above analyses, there was an interest in seeing if the actual attributions (i.e., the labels) that were made for real symptoms were similar to that made for the hypothetical symptoms presented in Study 1. Given the nature of subjects' experience, the only symptoms that could be used for this purpose were a headache, upset stomach and sore throat.[17]

Of the 51 people who reported a headache as their primary symptom, 10 said that they had additional symptoms. Therefore, the remaining 41 were chosen for this analysis. The results showed that 90% of the primary attributions for a real headache fell into one of the categories of Table 2. The two most frequently reported attributions were stress (N= 15) and fatigue (N= 7). Ninety-six percent and 100% of the secondary and tertiary attributions, respectively, also fell into the categories of Table 2. Stress and fatigue were again the two most frequently reported causes for the secondary attribution (Ns= 8 and 4, respectively). Only 10 people made a tertiary attribution, and no one attribution category appeared to be mentioned over another.

Seven students experienced an upset stomach. In each case, he or she made a primary and secondary attribution that could be classified with the categories in Table 5. Only one of the five tertiary attributions could not be classified with these categories. It was interesting to see that each of the classified attributions fell within the first eight categories listed in Table 5. These were the categories that were mentioned with higher frequency by the subjects of Study 1.

Only four students experienced a sore throat. In each case, his or her primary, secondary and tertiary attribution could be classified within the first seven categories of Table 6.

Overall, the above results are consistent with the findings of Study 1. This suggests that young adults display the tendency to think of innocuous or manageable types of causes for symptoms, both imagined and real.

<u>Attributional Effort (Question 3)</u>

A summary of the multiple regression analysis is displayed in Table 24. The eight dummy variables representing symptom type accounted for an adjusted 4% of the variance in attributional effort, but the analysis of variance for regression did not reach statistical significance. Symptom characteristics accounted for an additional 14% of the variance, but symptom duration was the only variable with a significant regression weight

Table 24

Summary for the Regression of Attributional Effort on Symptom, Behavioral, and Individual Difference Variables

Variables in the Equation	Adjusted R^2	Change in Adjusted R^2
Step 1		
Symptom Type (8 Variables)	.04[a]	--
Step 2		
Symptom Characteristics (5 Variables)	.18[b]	.14[c]
Step 3		
Attributional Response (1 Variable)	.21[d]	.03[e]
Step 4		
Individual Difference Measures (5 Variables)	.21[f]	.00[g]

[a] $F(8,98) = 1.49$, $p = .17$. [b] $F(13,93) = 2.80$, $p = .0021$.
[c] $F(5,93) = 4.45$, $p = .0011$. [d] $F(14,92) = 3.06$, $p = .0007$.
[e] $F(1,92) = 4.95$, $p = .03$. [f] $F(19,87) = 2.51$, $p = .002$.
[g] $F(5,87) < 1.00$, $p = .4333$.

(partial *r*= .42, *t*(93)= 4.46, *p*< .00005). Attributional response explained an additional 3% of the variance and was also statistically significant (partial *r*= .23, *t*(92)= 2.22, *p*= .0286). The individual difference variables explained none of the remaining variance.

A residuals analysis was conducted in order to examine the appropriateness of the linearity assumption. It was found that the scatterplot of the predicted and residual scores showed no discernible pattern. In addition, a normal probability plot indicated that the residuals possessed an underlying normal distribution. Given these findings, it was felt that the assumption of linearity was not violated.

It appears that the number of attributions that were made by subjects can be accounted for by the duration of the symptom and how quickly one began to think about those attributions. Specifically, individuals who had longer lasting symptoms and those who made their initial attribution at the time the symptom appeared tended to make more attributions.

Attributional Cues (Question 4)

When subjects were asked to describe the information that led them to make an attribution for their symptom, seven themes or categories emerged (see Table 25). A description of these, with an exemplary quote, is given briefly below.

Neglected action. The idea of a cause came to mind when the subject remembered that he or she neglected to do something that would prevent the development of a symptom (e.g., "I knew I wasn't dressed properly for the weather").

Past experience - pairing of symptom with cause. The subject thought of a cause from past experience -- or he/she had been pairing the symptom and cause in recent past experience (e.g., "I had these symptoms last year and the doctor diagnosed it as walking pneumonia. When I had these symptoms again, I just knew what it was. I didn't have to think about it. I just intuitively knew what the cause was. The thought of a virus was spontaneous.").

Event / activity. The subject inferred a cause for his or her symptom from an event that had taken place or was taking place at the time of the symptom (e.g., "I was waiting for my flight and it was canceled. After that, everybody was scrambling to book another flight. I just got a bad headache then.").

Contagion. The subject thought he or she was infected by someone who had a contagious condition or was

Table 25

Sources of Information that Subjects Used to Make Symptom Attributions

Source	Attribution Primary[a]	Secondary[b]	Tertiary[c]
Neglected Action	.06	.14	.09
Past Experience	.17	.00	.00
Event or Activity	.65	.45	.35
Contagion	.08	.06	.04
Aspects of the Symptom	.23	.16	.26
Developed More Symptoms	.00	.20	.26
Suggestions from Others	.02	.06	.04
Other	.01	.06	.13

Note: The figures in this table reflect proportions of subjects. The response of some subjects contained more than one theme. Thus, columns add to more than 1.00.

[a]N= 88. [b]N= 49. [c]N= 23.

affected by a noxious substance that had affected other people as well (e.g., "My boyfriend and I had eaten dinner together. He's a pretty healthy guy and he got sick too ... so I thought it must have been the sea food we ate").

Aspects of the symptom. The subject thought of a cause based upon some attribute of the symptom (e.g., "The nausea was intense and there was a grinding feeling in my stomach").

Developed more symptoms. The subject thought that a particular cause was operating when he or she developed additional symptoms (e.g., "[After a while] I developed diarrhea and got dizzy and felt weak").

Suggestions from others. The subject thought about a particular cause after someone else had proposed it (e.g., "My mom said that it might have been a bladder infection").

From Table 25 it can be seen that most of the respondents said that event cues and, to a lesser extent, symptom cues were the most useful in making symptom attributions. Although information from past experience was thought to play a major role, the data show that such experience was not helpful beyond the primary attribution.

When two independent raters used the categories of Table 25 to classify subjects' responses for the primary attribution, it was found that there was agreement on 84% of the cases. This was found to be significantly greater than the agreement expected by chance (i.e., 30%), *kappa*= .77, z= 10.04, p< .00005).

Outcomes of Self-Treatment (Question 5)

Belief in one's attribution. Table 26 shows the distributions of individuals who did and did not try to relieve their symptom. It is interesting to see that the percentage of those who attempted self-treatment steadily decreased from the primary to the tertiary attribution. This suggests that if subjects acquired attribution relevant information from the outcomes of self-treatment, it was most likely to occur during the earlier stages of the symptom.

The attempt at self-treatment was analyzed for the 31 people who made all three attributions. In result, it was found that the patterns of frequencies and statistical significance were very similar to that of Table 26. This indicates that the above findings are not due to the attrition of subjects across attributions.

When subjects were asked to discuss how the outcome of self-treatment influenced the belief in their attribution, several types of responses were found. Of the 13

Table 26

Distributions of Respondents Who Did and Did Not Attempt to Relieve Their Symptom

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Attempted	79	.71	18.89	<.0005
Did Not Attempt	33	.29		
Secondary[b]				
Attempted	40	.57	1.43	.232
Did Not Attempt	30	.43		
Tertiary[c]				
Attempted	9	.29	5.45	.020
Did Not Attempt	22	.71		

Note: For each analysis, df= 1.

[a]N= 112. [b]N= 70. [c]N=31.

individuals who noted that the outcomes cast doubt upon their attribution, all said that their symptom persisted. For example, there was one student who believed that a twitching in his hands was caused by lack of sleep. He treated his condition by going to bed so that he could get proper rest. When he awoke, the twitching was still there and he began to think that lack of sleep was probably not the cause of his symptom. When asked why he doubted his initial attribution he said, "I slept for a good amount of time and although the shaking stopped a little, it was still there. I didn't feel tired, but the shaking was still there."

Table 27 shows that belief in an attribution was strengthened after self-treatment primarily when a symptom was relieved. For example, one student felt that his sore throat was caused by a lot of yelling that he was doing at a soccer game. He treated himself by restricting his vocal activity. When the pain subsided he was convinced that yelling was the cause. During the interview he said, "Since I was not using my voice and the pain was getting better, I thought that yelling must have been the cause."

There were three subjects who found support for their attribution when their symptom got worse or did not go away. One of these individuals had a headache that she

Table 27

Perceived Explanations for Support of One's Attribution Following Self-Treatment Outcomes

	Attribution		
Explanation	Primary[a]	Secondary[b]	Tertiary[c]
Symptom was Relieved	.72	.73	1.00
Symptom Became Worse Or Did Not Go Away	.09	.00	.00
Attribution Was Self-Evident	.19	.00	.00
Other	.00	.27	.00

Note: The figures in this table are proportions of subjects.

[a]N= 32. [b]N= 26. [c]N= 6.

thought was caused by tension. She treated herself by eating something and found that the headache did not dissipate. In her own words she said, "Usually I can eat and make the headache go away. When I eat and the headache doesn't go away, I think that it must be stress."

A few students reported that belief in their attribution was strengthened following self-treatment outcomes, but this was not actually the case. It appears that they simply felt that that their attribution was self-evident. For example, there was one student who thought that his muscle aches and chills were caused by the flu. He treated himself by resting, drinking fluids and taking aspirin. When asked why he thought that the outcome of his action strengthened the belief in his attribution he said, "Common knowledge -- starve a cold, feed a fever, drink plenty of fluids. Doctors will tell you to do this."

When two independent raters used the categories in Table 27 to classify subjects' responses for the primary attribution it was found that there was agreement on 97% of the cases. This was found to be significantly greater than the agreement expected by chance (i.e., 57%), *kappa*= .93, z= 6.80, p< .00005).

Making a reattribution. Table 28 shows that

Table 28

Crosstabulation of the Belief Strength for One's Primary Attribution (Following Self-Treatment Outcomes) and the Making of a Secondary Attribution

		Belief in Primary Attribution		
		Weakened	Supported	Unaffected
Made Secondary Attribution	Yes	9 (.90)	15 (.47)	24 (.73)
	No	1 (.10)	17 (.53)	9 (.27)

Note: Parenthetical expressions are column proportions, $\underline{X}^2$ (2, N= 75)= 8.10, $\underline{p}$= .0174.

subjects tended to make a secondary attribution if their belief in the primary attribution was weakened or unaffected by self-treatment outcomes. If their belief was strengthened, however, subjects showed no tendency to make or not make a secondary attribution, X^2 (2, N= 75)= 8.10, p= .0174. This finding suggests that confirmation of one's attribution from self-treatment outcomes does not influence subsequent attributional activity. However, there is an inclination to make a reattribution if one's initial attribution is disconfirmed or unaffected.

Table 29 examines the tendency of making a tertiary attribution in terms of the strength of one's belief in the secondary attribution following self-treatment outcomes. The above finding was not replicated, X^2 (2, N= 40)= 3.70, p= .1574.

Sickness Beliefs (Question 6)

The perception of being sick. When respondents were asked if they considered themselves to be sick, it was expected that most would have felt that they were not. Table 30 shows that this expectation had greatest support at the time of the primary attribution. However, the tendency to believe that one was not sick diminished over time. In fact, the subjects who made a tertiary

Table 29

Crosstabulation of the Belief Strength for One's Secondary Attribution (Following Self-Treatment Outcomes) and the Making of a Tertiary Attribution

		Belief in Secondary Attribution		
		Weakened	Supported	Unaffected
Made Tertiary Attribution	Yes	2 (.50)	9 (.35)	7 (.70)
	No	2 (.50)	17 (.65)	3 (.30)

Note: Parenthetical expressions are column proportions, $\underline{x}^2$ (2, N= 40)= 3.70, $\underline{p}$= .1574.

Table 30

Distributions of Respondents Who Did and Did Not Believe They Were Sick

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Sick	26	.23	23.14	<.0005
Not Sick	86	.77		
Secondary[b]				
Sick	28	.40	2.80	.09
Not Sick	42	.60		
Tertiary[c]				
Sick	16	.52	0.03	.86
Not Sick	15	.48		

[a]N= 112. [b]N= 70. [c]N= 31.

attribution showed no inclination to believe one way or another. This finding implies that there might be an automatic tendency to doubt that one is sick when faced with common symptoms, but that this is likely to change with the passage of time. It might be more difficult to rule out being sick when one's symptom persists.

The perception of being sick was analyzed for the 31 people who made all three attributions. In result, it was found that the patterns of frequencies and statistical significance were similar to that of Table 30. This suggests that the above findings are not due to the attrition of subjects across attributions.

Making a reattribution. Table 31 shows that the perception of being sick at the time of the primary attribution did not inhibit the tendency to make a secondary attribution, X^2 (1, N= 112)= 2.06, p= .1514. Similarly, Table 32 shows that the perception of being sick at the time of the secondary attribution did not inhibit the tendency to make a tertiary attribution, X^2 (1, N= 70)= 0.77, p= .3790.

Lay Conferral (Question 7)

Discussing symptoms with lay consultants. Although it was expected that subjects would exhibit a tendency to

Table 31

Crosstabulation of One's Belief About Being Sick at the Time of the Primary Attribution and the Making of a Secondary Attribution

		Belief About Being Sick: Sick	Belief About Being Sick: Not Sick
Made Secondary Attribution	Yes	20 (.77)	53 (.62)
	No	6 (.23)	33 (.38)

Note: Parenthetical expressions are column proportions, $\underline{x}^2$ (1, N= 112)= 2.06, *p*= .1514.

Table 32

Crosstabulation of One's Belief About Being Sick at the Time of the Secondary Attribution and the Making of a Tertiary Attribution

		Belief About Being Sick	
		Sick	Not Sick
Made Tertiary Attribution	Yes	15 (.54)	18 (.43)
	No	13 (.46)	24 (.57)

Note: Parenthetical expressions are column proportions, $\underline{X}^2$ (1, N= 70)= 0.77, $\underline{p}$= .3790.

discuss their symptom with others, Table 33 shows that this was true only at the time of the primary attribution. The same pattern of frequencies and statistical significance was found for the 31 people who made all three attributions, thus indicating that findings are not due to the attrition of subjects across attributions.

Table 34 shows that the number of consulted individuals steadily decreased over time. It was interesting to find that the average number of lay consultants at the time of the primary attribution was very close to that reported by Sanders (1982) for a similar group of college students (i.e., 2.7).

Consistent with social comparison theory, students tended to talk about their symptom most often with friends (see Table 35). It was interesting, however, to see that they did not turn very often to siblings or roommates. Instead, they showed more of an inclination to have discussions with parents. Although this would not necessarily be predicted by social comparison theory, it might have occurred because younger people are accustomed to seeking parental advice during times of doubt.

The intention to discuss symptoms. Table 36 shows the distributions of subjects who did and did not intend to discuss their symptoms with others. There was no

Table 33

Distributions of Respondents Who Did and Did Not Discuss Their Symptom With a Lay Consultant

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Discussed	76	.68	14.29	<.0005
Did Not Discuss	36	.32		
Secondary[b]				
Discussed	37	.53	0.23	.63
Did Not Discuss	33	.47		
Tertiary[c]				
Discussed	13	.42	0.81	.37
Did Not Discuss	18	.58		

Note: For each analysis, df= 1.

[a]N= 112. [b]N= 70. [c]N= 31.

Table 34

The Number of Individuals With Whom Subjects Discussed Their Symptom

Attribution	Median	Range	
		Minimum	Maximum
Primary[a]	2.56	1	20
Secondary[b]	2.00	1	15
Tertiary[c]	1.60	1	3

Note: High maximum values were reported by three subjects who discussed their symptom during social gatherings.
[a]N= 76. [b]N= 36. [c]N= 13.

Table 35

Types of Individuals Whom Subjects Sought to Discuss Their Symptom

	Attribution		
Individual Sought	Primary[a]	Secondary[b]	Tertiary[c]
Coworkers	.13	.03	.00
Friends	.78	.65	.77
Parents	.41	.46	.31
Siblings	.14	.16	.15
Other Relatives	.09	.05	.00
Roommates	.24	.14	.08
Clergy	.01	.00	.00
Spouse	.05	.03	.08
Other	.07	.03	.00

Note: The figures in the table are proportions of subjects. Columns add to more than 1.00 because some subjects spoke with more than one type of individual.
[a]N= 76. [b]N= 37. [c]N=13.

Table 36

Distributions of Respondents Who Did and Did Not Intend to Discuss Their Symptom With a Lay Consultant

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Intended	37	.49	0.05	.82
Did Not Intend	39	.51		
Secondary[b]				
Intended	25	.68	4.57	.03
Did Not Intend	12	.32		
Tertiary[c]				
Intended	11	.85	6.23	.01
Did Not Intend	2	.15		

Note: For each analysis, df= 1.

[a]N= 76. [b]N= 37. [c]N=13.

observable inclination at the time of the primary attribution. Over time, however, there was a steady increase in the proportion of individuals who wanted to discuss their symptom.

The intention to discuss symptoms was analyzed for the 13 people who made all three attributions. In result, it was found that the patterns of frequencies and statistical significance were very similar to that of Table 36, thus indicating that the above findings are not due to the attrition of subjects across attributions.

It is interesting to consider this finding in light of what was found with the data in Table 33. Although the general tendency to talk with a lay consultant decreased over time, the individuals who did discuss their symptom apparently had an increasing desire to do so.

The correlations of perceived discomfort with the intent to discuss one's symptom at the time of the primary, secondary, and tertiary attributions were -.11, .26, and .55, respectively. The same correlations for perceived seriousness were, in order, -.05, .12, and .37. A similar pattern of coefficients was found with those individuals who made all three attributions. For discomfort, the correlations were .15, .14, and .55, respectively. And for perceived seriousness the correlations were .03, .03, and .37, respectively. None of the coefficients reached the .05 level of significance, but it is worth noting that the relationship between subjective distress and the intent to discuss one's symptom tended to increase over time. This makes sense in terms of social comparison theory. If individuals had symptoms that were discomforting (either physically or psychologically) and they were unable to establish a cause at an early point, then the need for comparison information would probably increase over time.

Lay consultants who made an attribution. Table 37 reveals that lay consultants tended to make an attribution for subjects' symptoms only at the time of the primary attribution. It should be noted, however, that although statistical significance diminished across analyses, the relative distributions of responses remained somewhat constant. Just about two thirds of the subjects reported that a lay consultant made an attribution for his or her symptom at the point of the primary, secondary, and tertiary attribution.

Table 38 indicates that lay consultants tended to make symptom attributions that were similar to those made by subjects. In addition, subjects reported that this made them believe more strongly in their attribution (see

Table 37

Distributions of Respondents Who Said That a Lay Consultant Did and Did Not Make a Symptom Attribution

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Did	49	.65	6.37	.01
Did Not	27	.35		
Secondary[b]				
Did	22	.60	1.32	.25
Did Not	15	.40		
Tertiary[c]				
Did	9	.69	1.92	.17
Did Not	4	.31		

Note: For each analysis, df= 1.

[a]N= 76. [b]N= 37. [c]N= 13.

Table 38

Distributions of Respondents Who Said That a Lay Consultant Made a Similar or Different Symptom Attribution

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Similar	39	.80	17.16	<.0005
Different	10	.20		
Secondary[b]				
Similar	17	.77	6.55	.01
Different	5	.23		
Tertiary[c]				
Similar	6	.67	1.00	.32
Different	3	.33		

Note: For each analysis, df= 1.

[a]N= 49. [b]N= 22. [c]N= 9.

Table 39). Both of these trends were evident at the time of the primary and secondary attributions.

The data for Tables 37, 38, and 39 were re-analyzed for the individuals who made all three attributions (Ns= 13, 9, and 6, respectively). In result, it was found that the patterns of frequencies and statistical significance were similar for the subjects from Tables 37 and 38. However, the small number of subjects from Table 39 made it difficult to observe a response pattern. Overall, this suggests that the above findings are not due to the attrition of subjects across attributions.

Making a reattribution. Table 40 shows that the belief strength in one's primary attribution following a lay consultant's causal ascription was unrelated to the tendency to make a secondary attribution, X^2 $(2, N= 49)= 3.28$, $p= .194$. Likewise, Table 41 indicates that the belief strength in one's secondary attribution under the same conditions was unrelated to making a tertiary attribution, X^2 $(2, N= 22)= 3.18$, $p= .204$.

Lay consultants who did not make an attribution. In a number of instances, lay consultants did not propose a cause for the subject's symptom but said something that reportedly strengthened the belief in the subject's attribution. Table 42 depicts the types of information

Table 39

Distributions of Respondents Who Said That They Did and Did Not Feel More Strongly About Their Attribution When It Was Shared by a Lay Consultant

Attribution	Frequency	Relative Frequency	Chi-Square Value	p
Primary[a]				
Did	31	.80	13.56	<.0005
Did Not	8	.20		
Secondary[b]				
Did	16	.94	13.24	<.0005
Did Not	1	.06		
Tertiary[c]				
Did	4	.67	0.67	.41
Did Not	2	.33		

Note: For each analysis, df= 1.

[a]N= 39. [b]N= 17. [c]N= 6.

Table 40

Crosstabulation of the Belief Strength for One's Primary Attribution and the Making of a Secondary Attribution Following an Attribution That Was Made by a Lay Consultant

Made Secondary Attribution		Belief in Primary Attribution: Strengthened	Weakened	Unaffected
	Yes	21 (.68)	6 (.86)	5 (.45)
	No	10 (.32)	1 (.14)	6 (.55)

Note: Parenthetical expressions are column proportions, $\underline{x}^2$ (2, N= 49)= 3.28, *p*= .194.

Table 41

Crosstabulation of the Belief Strength for One's Secondary Attribution and the Making of a Tertiary Attribution Following an Attribution That Was Made by a Lay Consultant

		Belief in Secondary Attribution		
		Strengthened	Weakened	Unaffected
Made Tertiary Attribution	Yes	8 (.50)	3 (1.00)	1 (.33)
	No	8 (.50)	0 (.00)	2 (.67)

Note: Parenthetical expressions are column proportions, $\underline{x}^2$ (2, N= 22)= 3.18, $\underline{p}$= .204.

Table 42

Types of Information that Supported Subjects' Symptom Attribution When the Lay Consultant Did Not Make an Attribution

Type of Information	Frequency[a]	Relative Frequency
The Lay Consultant Had a Similar Problem	6	.33
The Lay Consultant Agreed With The Attribution	4	.11
The Lay Consultant Gave Implied Support	8	.44

Note: The data were collapsed across the primary and secondary attribution because the Ns were small. There were no data on this item for the tertiary attribution.

[a]N= 18.

that fall into this category.

In some cases a lay consultant noted that he or she had a problem that was similar to that of the subject. For example, there was one individual who felt that a piercing pain in her lower right abdomen was caused by hunger. When she described her encounter with a friend she noted the following: "She said that she had been feeling hunger pains lately. I said 'Yeh, I've been feeling these a lot lately too'."

In other instances, the lay consultant simply agreed with the subject's appraisal of his or her condition. For example, one student had an itchy rash that he thought was caused by a chemical fertilizer that he encountered while playing soccer. When he described a discussion with a friend he said, "I told him what I thought was the cause of the rash, and he agreed with me."

In still other instances, the lay consultant gave some type of implied support for the subject's attribution. In other words, something was said that provided indirect or unintentional support. For example, one respondent had a headache that she believed was caused by tension. During the interview she described what a work associate told her: "She said that this place can drive you nuts. She's a ward secretary like me and does similar kinds of work."

There was a total of five people who felt that the lay consultant made a comment that cast doubt upon their attribution. Obviously, there were not enough cases to form meaningful groupings. However, it appeared as though the lay consultant basically discounted the subject's attribution. For example, there was one student who had a headache that he believed was caused by too much smoking. He discussed his friend's reaction to this by saying, "My friend thought I was crazy. He's a lifetime smoker and he never got a headache from cigarettes."

When two independent raters used the categories In Table 42 to classify subjects' responses for the primary attribution it was found that there was agreement on 93% of the cases. This was found to be significantly greater than the agreement expected by chance (i.e., 37%), *kappa*= .89, $z = 4.69$, $p < .00005$).

Making a reattribution. Table 43 shows that the belief strength in one's primary attribution following a lay consultant's comments was unrelated to the tendency to make a secondary attribution, X^2 (2, $N = 27$) = 0.79, $p = .673$. Similarly, Table 44 indicates that the belief strength in one's secondary attribution under the same conditions was unrelated to making a tertiary attribution,

Table 43

Crosstabulation of the Belief Strength for One's Primary Attribution and the Making of a Secondary Attribution Following a Discussion in Which a Lay Consultant Did Not Make an Attribution

		Belief in Primary Attribution		
		Strengthened	Weakened	Unaffected
Made Secondary Attribution	Yes	11 (.73)	2 (1.00)	7 (.70)
	No	4 (.27)	0 (.00)	3 (.30)

Note: Parenthetical expressions are column proportions, χ^2 (2, N= 27)= 0.79, *p*= .673.

Table 44

Crosstabulation of the Belief Strength for One's Secondary Attribution and the Making of a Tertiary Attribution Following a Discussion in Which a Lay Consultant Did Not Make an Attribution

		Belief in Secondary Attribution		
		Strengthened	Weakened	Unaffected
Made Tertiary Attribution	Yes	2 (.67)	0 (.00)	3 (.30)
	No	1 (.33)	2 (1.00)	7 (.70)

Note: Parenthetical expressions are column proportions, $\underline{X}^2$ (2, N= 15)= 2.25, $\underline{p}$= .279.

$\underline{X}^2$ (2, $\underline{N}$= 15)= 2.55, $\underline{p}$= .279.

Use of Medical Guides and Health Professionals (Question 8)

The data in Tables 45 and 46 are fairly clear. It is evident that few subjects consulted medical guides or health professionals to help them diagnose their symptoms. However, it was found that subjects were more likely to visit a health professional than read a medical guide at the time of the tertiary attribution, Cochran $\underline{Q}$ (1, N= 31)= 5.00, $\underline{p}$= .0253. These analyses indicate that individuals who experience common symptoms are not likely to seek, and thus not use, attribution information that is acquired from formal or professional sources (even though they are relatively more likely to see a doctor or nurse during the latter course of their symptom).

The use of medical guides and health professionals were re-analyzed for those individuals who made all three attributions (N= 31 for each analysis). In both cases it was found that the patterns of frequencies and statistical significance were very similar to that in Tables 45 and 46. Hence, the above findings are probably not due to to the attrition of subjects across attributions.

Table 45

Distributions of Respondents Who Said That They Did and Did Not Refer to a Medical Guide

Attribution	Frequency	Relative Frequency	Chi-Square Value	*p*
Primary[a]				
Did	6	.05	89.29	<.0005
Did Not	106	.95		
Secondary[b]				
Did	3	.04	57.52	<.0005
Did Not	66	.96		
Tertiary[c]				
Did	0	.00	31.00	<.0005
Did Not	31	1.00		

Note: For each analysis, df= 1.

[a]N= 112. [b]N= 69. [c]N= 31.

Table 46

Distributions of Respondents Who Said That They Did and Did Not Seek Professional Medical Help

Attribution	Frequency	Relative Frequency	Chi-Square Value	p
Primary[a]				
Did	12	.11	69.14	<.0005
Did Not	100	.89		
Secondary[b]				
Did	5	.07	51.43	<.0005
Did Not	65	.93		
Tertiary[c]				
Did	5	.16	14.23	<.0005
Did Not	26	.84		

Note: For each analysis, df= 1.

[a]N= 112. [b]N= 70. [c]N= 31.

Doubt-Provoking Information (Question 9)

Types of doubt-provoking information. When subjects were asked if there was anything that made them think that their attribution might be wrong, nine themes or categories emerged. These are listed in Table 47. Surprisingly, about half the categories were found to be similar to those in Table 25. This would indicate that individuals draw upon a similar range of information to aid them in deciding the likelihood and *un*likelihood of symptom attributions. Each of the categories are described below.

Neglected action. The subjects doubted an attribution when there was a recollection that he or she neglected to do something that would keep him or her from developing a symptom. For example, one student initially thought that her headache was caused by stress but then changed her mind. She said, "I didn't eat much that day. I just had juice in the morning. I thought that that might be causing the headache."

Unexpected symptom behavior. The subject was inclined to discount an attribution because the behavior of his or her symptom was not consistent with that attribution (e.g., the symptom persisted too long, went away too soon, or acted in an unusual or unpredictable way).

Table 47

Sources of Information that Cast Doubt Upon One's Symptom Attribution

	Attribution		
Source	Primary[a]	Secondary[b]	Tertiary[c]
Neglected Action	.08	.00	.07
Unexpected Symptom Behavior	.38	.29	.43
Developed Unexpected Symptoms	.13	.16	.00
Attribution/Self-perception Inconsistency	.12	.13	.21
Event/Activity	.19	.10	.07
Suggestions From Others	.10	.00	.07
Doctor's Diagnosis	.00	.10	.07
Lack of Expected Symptoms	.02	.19	.07
Contagion	.08	.03	.00
Other	.02	.06	.00

Note: The figures in this table represent proportions of subjects. Response of some subjects contained more than one theme. Thus, some columns add to more than 1.00.

[a]N= 52. [b]N= 31. [c]N= 14.

One student initially thought that her stomach ache was cased by drinking too much Cola. She doubted this later. Her comment about this was, "I wouldn't expect sharp pains from the Coke. I had sharp pains."

Developed unexpected symptoms. There was doubt regarding an attribution when the individual experienced additional symptoms that were not consistent with his or her attribution. One person thought that a swollen left ear was caused by trauma which he sustained while wrestling with a friend. He then felt that this was not the case when he developed an unexpected symptom. He said, "My ear was turning black on the inside and I thought that getting hit on the outside of the ear wouldn't affect the inside of the ear."

Attribution / self-perception inconsistency. This category is actually called "Inconsistency between One's Attribution and the Observation of One Self, One's activity, or One's past experience." Basically, the respondent discounted an attribution because it was inconsistent with knowledge of his or her actions, behaviors or past experience. For example, there was one student who had a headache that he initially thought was caused by lack of sleep. He mentioned that he discredited this idea by saying, "I knew how much sleep I had during the week. I knew I was getting eight hours of sleep a day."

Event / activity. The respondent thought that his or her attribution might be incorrect based upon the observation of some event or activity. One student had a headache that he thought was due to eye strain. When asked why he began to doubt this he said, "Just the fact that I knew that I had been stressed out for a while. I had a lot of school work to do and I had a few personal problems."

Suggestions from others. Doubt regarding an attribution occurred when someone suggested an alternative explanation for one's symptom. For example, one respondent had a sore throat and fever that he believed was caused by the cold weather. When he was asked why he started to discount this he said, "My friend mentioning that I could have mono."

Doctor's diagnosis. Individuals abandoned their symptom attribution when a physician made a contrary diagnosis.

Lack of expected symptoms. The doubt about an attribution began to occur when someone did not get expected symptoms. One student, for example, had a fever that he thought was due to the flu. When asked why he gave up on this idea he said, "I didn't have nausea."

Contagion. Doubt regarding an attribution occurred when an individual thought he or she was infected by someone who had a contagious condition or was affected by a noxious substance that had affected other people as well. There was one person who thought that his sore throat was due to his being "run down." He was asked why he felt that this attribution might not be correct. He said, "My roommate had been sick earlier and I thought I might have picked up something from him."

Looking at that the overall proportions in Table 47 it can be seen that most of the respondents said that doubt about an attribution was provoked by symptom cues, especially the unexpected behavior of symptoms. A fewer, but noteworthy, number also mentioned event cues and the perception of inconsistency as described above.

Persuasion and expectancy/outcome incongruity were discussed earlier in terms of their presumed ability to promote reattributions. The data suggest that both are possible, but the latter is much more likely to occur. In fact, expectancy/outcome incongruity appears to be a most influential factor.

Making a reattribution. The last two tables describe the relationship between doubt-provoking information and subsequent attribution activity. Table 48 shows that when subjects believed there was something to suggest doubt in their primary attribution, they tended to make a secondary attribution. When doubt was absent, they tended to retain their primary attribution, $\underline{X}^2$ (1, $\underline{N}$= 112)= 24.59, $\underline{p}$< .00005. Table 49 replicates this finding for the secondary and tertiary attributions, $\underline{X}^2$ (1, $\underline{N}$= 70)= 4.47, $\underline{p}$= .0345.

Table 48

Crosstabulation of the Presence of Doubt-Provoking Information for the Primary Attribution and the Making of a Secondary Attribution

		Doubt-Provoking Information: Present	Doubt-Provoking Information: Absent
Made Secondary Attribution	Yes	49 (.88)	24 (.43)
	No	7 (.12)	32 (.57)

Note: Parenthetical expressions are column proportions, $\underline{X}^2$ (1, N= 112)= 24.59, $\underline{p}$< .00005.

Table 49

Crosstabulation of the Presence of Doubt-Provoking Information for the Secondary Attribution and the Making of a Tertiary Attribution

		Doubt-Provoking Information	
		Present	Absent
Made Tertiary Attribution	Yes	19 (.61)	14 (.36)
	No	12 (.39)	25 (.64)

Note: Parenthetical expressions are column proportions, χ^2 (1, N= 70)= 4.47, *p*= .0345.

DISCUSSION FOR STUDY 2

There are four conclusions about the naive diagnostician that can be drawn from the results of Study 2. Each of these is discussed below.

A NUMBER OF ATTRIBUTIONS ARE TYPICALLY MADE DURING THE COURSE OF A SYMPTOM.

The results of Study 2 have shown that 63% of the subjects thought about two or more causes for their symptom. It appears that multiple attributions are typical of self-diagnosis. The naive diagnostician probably needs to consider a number of potential causes because he or she does not collect systematic data. As such, attributions are made and then evaluated for accuracy with information that is easily available. This is in contrast to the diagnostic activity of young medical students who are content with the first plausible diagnosis that comes to mind and are inclined to favor evidence that supports it (Mentzer & Snyder, 1982).

It was surprising to find that the number of attributions made by subjects was related only to symptom duration and attributional response. Although symptom enumeration was discussed in Study 1 as a possible individual difference variable, the results of Study 2 show that it bore no relationship to attributional effort. In other words, the extent to which perceived causes came to mind was unrelated to how much work one actually put into his or her self-diagnosis. If diagnostic effort is independent of symptom features (e.g., discomfort, seriousness, prior experience), and health-related personality traits (e.g., private body consciousness), it would appear that the naive diagnostician relies heavily upon cognitive activity. The results of Study 2 suggest that inconsistency between one's attribution and symptom activity is a major driving force of attributional effort. This will be discussed in more detail later.

ATTRIBUTIONS ARE TRIGGERED PRIMARILY BY EVENT AND SYMPTOM CUES.

The analysis of open-ended responses found that different types of information were useful for making symptom attributions. However, the most useful were events and activities that occurred at or around the time of the symptom. Following this were aspects of the symptom and the development of additional symptoms. Although prior experience was thought to be a rich source of information, it was not found to be useful beyond the primary attribution.

The generalization of this finding to older individuals is questionable. The subjects of Study 2 were young, healthy college students who have not experienced a great deal of illness. In addition, they are involved in an active social and academic life that includes experiences such as dating, socialization, stressful examinations and so on. Hence, it is not difficult to see why these individuals rely more upon event cues than past experience cues. If older or infirm groups of people were surveyed, it might be found that the relative usefulness of these cues would be different -- past experience cues might be given equal or more weight than event cues.

The fact that subjects relied upon symptom information to help them make an attribution appears to be consistent with the illness prototype model, but not with the hypothesis verification model. The latter presumes that symptoms confirm an existing hypothesis about the cause of an ill feeling. Many of the subjects in Study 2, however, used the quality and behavior of symptoms to _generate_ a hypothesis. At the outset of this study it was believed that symptom attributes were important to the naive diagnostician, but it was not realized _how_ important. Although the qualities of symptoms do not seem to account for the number of attributions that were made, they do appear to be a major influence for the type of attributions that were made.

THE NAIVE DIAGNOSTICIAN TENDS TO MAKE INNOCUOUS AND MANAGEABLE ATTRIBUTIONS FOR SYMPTOMS.

Consistent with Study 1, the subjects in Study 2 made attributions that were predominately internal, controllable and unstable. This demonstrates that the subjects from both studies tended to think of harmless and manageable causes for symptoms.

At the time of Study 1 it was felt that subjects' benign causes could be explained in three ways: (1) by the nature of the experimental task (being provided with common, harmless symptoms), (2) by some form of intrinsic response tendency such as a motivational bias, and (3) by the fact that most young and healthy people are not typically bothered with serious conditions (and thus are not considered during self-diagnosis).

The results from Study 2 have shown that individuals made benign and manageable attributions for a variety of real symptoms that covered a wide range of perceived discomfort and seriousness. It is therefore logical to assume that thinking of these types of causes is not simply an experimental artifact.

The results, however, cannot discredit either of the other two explanations. It was mentioned earlier that Ditto et al. (1988) found that subjects tended to mitigate the threat of illness when they were erroneously informed that a they had pancreatic disease. The authors argue that there is an automatic tendency to minimize illness threat. Likewise, Robinson (1971) has noted that it is common for people to think of benign interpretations of a symptom when it is experienced by all members of a family or when it is an expected part of one's role (e.g., tiredness of a blue collar worker). Hence, a motivational bias and the low incidence of serious conditions in one's life can both account for the types of causes that were found in Studies 1 and 2. Whatever the explanation, the tendency to think of innocuous and manageable causes for symptoms is evident. However, additional research will need to be done in order to shed additional light upon this matter.

SYMPTOM REATTRIBUTIONS ARE STIMULATED PRIMARILY BY INCONSISTENCY.

One of the goals of Study 2 was to examine factors that nurture and inhibit symptom reattributions. It was believed that the outcome of self-treatment, the perception of being sick, discussions with lay consultants, visits with health professionals, and information in medical guides would be sources of such influence.

It was found that some of these factors are consistent throughout the course of one's symptom, while others are not. Subjects rarely visited a health professional or read a medical guide to help them interpret their symptom. The former is not surprising given that college age people are known to be low users of health care providers (NCHS, 1981; Sanders, 1982) and, indeed, are usually quite healthy. Collectively, however, these findings indicate that doctors, nurses, and medical guides are consistently not utilized as sources of attributional information. These sources could certainly be helpful, but they are not commonly sought by young, healthy individuals.

The frequency of those who treated their symptom and those who discussed it with a lay consultant was high at the beginning. However, this changed. By the time of the tertiary attribution, subjects reported that they were <u>not</u> treating their symptom and that they had no preference for talking with a lay consultant. This suggests that attributional information from these sources would come early during the course of one's symptom.

The perception of being sick also showed change over time. At first, subjects tended to believe that they were not sick. By the time of the tertiary attribution the tendency disappeared. If this perception is influential, one would expect to see reattributions primarily towards the beginning of symptomatic episodes.

The results demonstrated that reattributions were not reliably related to any of the above factors. Although subjects <u>felt</u> that the belief in their attribution was influenced, there was no systematic connection with behavior.

Only one analysis uncovered a correlate. Subjects tended to make a secondary attribution if the belief in their primary attribution was weakened or unaffected by the outcome of self-treatment. If the belief was strengthened, they showed no tendency to make or not make a secondary attribution.

This finding is most unusual and should be interpreted carefully. If the outcome of self-treatment is influential, one would expect to see people making reattributions when their attribution belief is weakened, and <u>not</u> making reattributions when their belief is strengthened. Perhaps this is what might have been happening, but the sample size (N= 75) was too small to detect it. In fact, a larger sample size would have been more favorable for the interpretation of the other reattribution analyses.

The most interpretable findings were related to subjects' responses about doubt-provoking information. The last two tables in the results section show that when subjects had doubt about their attribution they tended to make a reattribution, otherwise they did not. An analysis of open-ended responses found that subjects doubted their attribution when it was inconsistent with subsequent symptom behavior. Doubt was also provoked when they developed unexpected symptoms or did not experience symptoms that were expected. The inconsistency between an attribution and the perception of one's actions or past experience also provoked doubt. Although not related to inconsistency, events that suggested another plausible cause for one's symptom appeared to have a similar effect.

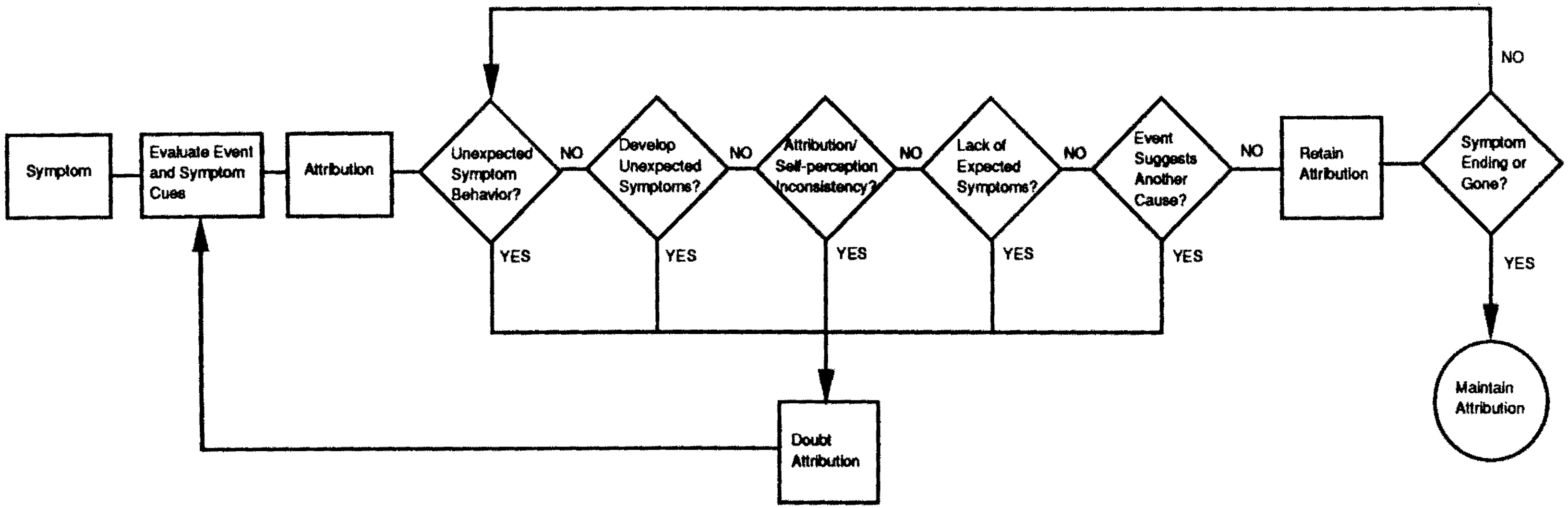
A Model of the Naive Diagnostician

The facts that have been learned from this study can be synthesized into a model of the naive diagnostician. Although this cannot represent the experience of everyone, it summarizes the accounts of many individuals who were involved in this study.

Figure 2 shows that when a symptom is experienced, an attribution is made by evaluating event and/or symptom cues. Doubt is cast upon the attribution if one or more of the following occur: (1) the symptom behaves in an unexpected fashion, (2) unexpected symptoms occur, (3) there is inconsistency between an attribution and the observation of one's past actions or experience, (4) expected symptoms do not occur, and (5) an event suggests another plausible cause. If there is doubt, the individual evaluates current event and symptom cues in order to make a reattribution. If none of the doubt-provoking events occurs, one's attribution or reattribution is retained for the duration of the symptom. The individual finally concludes that the symptom was caused by the factor that was on his or her mind at the end of the symptom episode.

The model in Figure 2 can provide insight to the delay in seeking medical care that is characteristic of heart attack victims (e.g., see Green at al., 1974). It was noted earlier that many individuals misdiagnose the prodromal symptoms of a myocardial infarction as indigestion. This might be related to the nature of the

Figure 2. A Model of the Naive Diagnostician.



symptom (a painful chest discomfort) as well as the time at which it occurs (after eating a meal). If the symptom and event cues indicate indigestion to the perceiver, this is the attribution that will be retained until something casts doubt upon it. The victim will begin to change his or her mind when the presumed indigestion does not dissipate within an expected period of time, or when unexpected symptoms such as severe chest pains occur. In either case, this takes time. Time that might prove to be fatal.

Applications

The application of research findings must always be made carefully. However, it appears that knowledge acquired from this study could be useful in at least two ways.

First, health professionals should be apprised of the characteristics of the naive diagnostician. They should learn how lay individuals think about the causes of their symptoms. If for no other reason, this will reify the notion that average individuals possess ways of thinking that are quite different from what is learned through professional education, a point that is often forgotten. A knowledge of the naive diagnostician could provide direction for research in problematic areas such as non-compliance and the delay in seeking health care. In addition, it could potentially increase the general impact of health care practice by creating a tangible model of how patients think. This could be used to maximize the efficacy of therapeutic interventions (cf. Gillick, 1985).

Second, patients and other lay individuals should be introduced to the tendencies of their thinking about symptoms. This could be accomplished through patient or community education programs. By learning about naive diagnostic reasoning, people can become aware of how natural inclinations at self-diagnosis can have a major impact upon their health. In all, this could promote considerable insight as well as a sense of mastery about one's own health care management.

Conclusion

Using a survey approach, Study 2 examined the attributional activity of young adults who experienced a real symptom. The purpose of this was to discover the ways in which symptom attributions are formed and altered over time.

The results of Study 2 were synthesized into a model of the naive diagnostician. This model posits that a symptom attribution is initially triggered by event and symptom cues. If one encounters something that casts doubt upon that attribution, he or she makes a *re*attribution. If not, the perceived cause is retained until the symptom dissipates.

The model of the naive diagnostician offers a new perspective on the topic of symptom attribution. It is a simple model that has its origin in the accounts of young adults who have experienced real symptoms. Its major distinguishing feature is that it views symptom attributions in the context of a dynamic process -- a kind of trial and error. This does not guarantee diagnostic accuracy, but it recognizes the average person as an active participant in his or her self-diagnosis.

In the future, research efforts should be focused upon tests of the model. For example, it will be important to see how well the model predicts the self-diagnosis of older adults as well as post-attributional behaviors such as self-treatment strategies and the decisions to seek health case. Overall, the model needs to be pushed to its limits in order to discover its strengths and weaknesses. As this is done, more will be known about the naive diagnostician.

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FOOTNOTES

1. A colostomy is a surgical procedure that routes the colon to an artificial exit in the abdomen. Waste is collected in a small plastic bag. Spillage occurs when the seal between the bag and the abdomen becomes loose. Many spillages are due to a watery discharge.

2. Students were asked to record their grade point average as a proxy measure for intelligence. However, only eight individuals could provide this information because most were first year freshmen. As such, the variable was not reported nor used in any analyses.

3. The dimensions of locus, stability, and controllability -- and the dimensions of internality, stability, and globality appear to be similar in nature. In addition, both schemes have been used in attributional research. However, the former dimensions have been used primarily in studies where the investigator has classified perceived causes, whereas the latter dimensions have been used in studies where subjects have classified or rated perceived causes. Therefore, the former dimensions were used in the present study because the investigator was classifying subjects' perceived causes and because the scheme appeared to be more applicable to the present research.

4. An important distinction needs to be made here. A cause was considered controllable if it was felt that an individual could exert an influence on the cause itself, not the resulting symptom. Thus, an allergy was classified as uncontrollable because there is nothing that the average individual can do to influence his or her immune system, even though one can take a non-prescription drug that will alleviate the symptoms of an allergy.

5. This was a finding from a survey of college students that was conducted by the investigator at an earlier time.

6. Subjects' position at the university was

not used in the multiple regression analyses because of its high correlation with age. In a one-way analysis of variance it was found that student position accounted for 84% of the variance in age, F (2, 32) = 86.76, p < .00005 (it should be noted here that there were three classes of student position: "freshman," "sophomore," and "junior & senior" because there was only one subject who was a senior). Including both the age and position variables in the regression would have created a multicolinearity problem.

7. The enumeration scores of the four other symptoms were averaged (rather than entered as a set) because of their moderate interrelationship. When all five scores were intercorrelated it was found that the Pearson coefficients ranged from .20 to .63. The average was .44. Seven of the ten coefficients were statistically significant (all p's $\leq$ .011), and two others approached the .05 level of significance (p's = .061 and .075). Again, there was a concern about multicolinearity.

8. The means in Table 8 are higher then what can be computed from the frequencies in Tables 2-6. This is because the means in Table 8 are a function of everything that was listed by subjects. The frequencies in the other tables are a function of categories that were created by grouping similar responses. For example, if a student wrote that a headache can be caused by (1) pressure, (2) stress, (3) tension, and (4) an allergy, he or she received an enumeration score of 4. This is because enumeration was viewed as a measure of the extent to which causes came to mind. The score was thought to be a reflection of cognitive activity. However, grouping the _types_ of causes that were mentioned by the above student, only categories of "stress" and "an allergy" would be checked. This is because the first and third responses are synonymous with stress. If grouping did not occur in this fashion, Tables 2-6 would be unmanageably large.

9. Before Study 2 was conducted, eight subjects were interviewed with the Symptom Attribution Survey. The purpose of these pilot interviews was to test the instrument and to correct any problems with it.

10. In addition to this, scheduling was a constant problem throughout the eight months that data were collected (11/3/86 - 6/24/87). Having to schedule two visits with each subject would have significantly increased the time needed to collect data.

11. For subjects who believed that their symptom could have multiple causes, their enumeration score was the number of entries for item 17. For those who believed that their symptom could only have one cause, their enumeration score was assigned a value of 1.

12. Data on the subjective meaning of "being sick" were collected, but are not reported in this study.

13. If more than one person was consulted, the subject was asked to focus upon the first person with whom he or she talked.

14. At the outset of Study 2 there was an interest in analyzing the tendency to make a reattribution as a function of the information from health professionals and medical guides. It was found, however, that only a few people discussed their symptom with a physician or sought the help from a medical guide. As a result, an analysis could not be conducted because there were not enough subjects to create contingency tables with cell sizes greater than one or two. In a number of instances cell frequencies were zero, thus making it impossible to create two dimensional contingency tables.

15. It should be kept in mind that these figures reflect a national sample. Because college undergraduates are a subsample of those 15-24 years of age, the percentage of seeking health care for a headache might be lower than 13.6%.

16. Symptom duration exhibited a great deal of variability. The following is a more detailed description:

Symptom Duration	Proportion of Sample
< 1 day	.34
1 - 2.5 days	.16

3 - 4	days	.08
5 - 6	days	.04
1	week	.09
1+ - 4	weeks	.24
6 - 22	weeks	.05

17. In order to compare the actual attributions made by subjects in Studies 1 and 2 it was important that the symptoms be as similar as possible. The decision was made that a subject from Study 2 would be selected for this analysis if and only if he or she had a symptom that was identical to one of the hypothetical symptoms presented in Study 1 <u>and there were no other coexisting symptoms</u>. Thus, subjects who experienced a headache, upset stomach, or sore throat satisfied this criterion.

APPENDIX A

SYMPTOM SURVEY

This is a short survey about peoples' perceptions of the causes for physical symptoms. On the following pages, we would like you to write down what you feel are the possible causes for five common symptoms.

Please read the instructions on each page and **take as much time as you need.** If you have any questions, please notify the study coordinator.

We wish to thank you in advance for your participation in this study.

On the Lines below, please list what you feel are the possible causes for:

A HEADACHE

Take your time and list as many causes as you can think of. There are no right or wrong answers on this task, so do not hesitate to write down anything that comes to mind.

Please write one cause per line. Use as many or as few lines as you need.

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. _______________________________________
11. _______________________________________
12. _______________________________________
13. _______________________________________
14. _______________________________________
15. _______________________________________ 1

Use the back of this sheet if you need more space to write.

On the Lines below, please list what you feel are the possible causes for:

WATERY EYES

Take your time and list as many causes as you can think of. There are no right or wrong answers on this task, so do not hesitate to write down anything that comes to mind.

Please write one cause per line. Use as many or as few lines as you need.

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______
11. ______
12. ______
13. ______
14. ______
15. ______ 2

Use the back of this sheet if you need more space to write.

On the Lines below, please list what you feel are the possible causes for:

A CONGESTED NOSE

Take your time and list as many causes as you can think of. There are no right or wrong answers on this task, so do not hesitate to write down anything that comes to mind.

Please write one cause per line. Use as many or as few lines as you need.

1. ______

2. ______

3. ______

4. ______

5. ______

6. ______

7. ______

8. ______

9. ______

10. ______

11. ______

12. ______

13. ______

14. ______

15. ______ 3

Use the back of this sheet if you need more space to write.

On the Lines below, please list what you feel are the possible causes for:

AN UPSET STOMACH

Take your time and list as many causes as you can think of. There are no right or wrong answers on this task, so do not hesitate to write down anything that comes to mind.

Please write one cause per line. Use as many or as few lines as you need.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________
11. ____________________
12. ____________________
13. ____________________
14. ____________________
15. ____________________ 4

Use the back of this sheet if you need more space to write.

On the Lines below, please list what you feel are the possible causes for:

A SORE THROAT

Take your time and list as many causes as you can think of. There are no right or wrong answers on this task, so do not hesitate to write down anything that comes to mind.

Please write one cause per line. Use as many or as few lines as you need.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
11. ______________________________
12. ______________________________
13. ______________________________
14. ______________________________
15. ______________________________ 5

Use the back of this sheet if you need more space to write.

1-(1) ___ ___ ___ (4)

1. **Please write in your age on the line below.**

____

(5) (6)

2. **Please circle your gender category.**

1. Male 2. Female (7)

3. **Please circle the one category that best describes your racial affiliation.**

1. Caucasian (not of Hispanic Origin)
2. Black
3. Hispanic
4. Oriental/Asian or Pacific Islander
5. American Indian or Alaskan Native
6. Other (please specify ________________)

(8)

4. **Please circle the one category that best describes your position at Loyola.**

1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Unclassified Student
6. Other (please specify ________________)

(9)

5. **Are you a nursing or other type of health professions student? (note that individuals who are enrolled in premedical and predental programs are <u>not</u> health professions students). (circle one)**

1. Yes 2. No (10)

6. **Are you a trained health professional (such as a nurse or physical therapist)? (circle one)**

1. Yes 2. No (11)

7. **Please write in your overall grade point average on the line below. If you do not know your GPA or are unsure of it, put an "X" on the line.**

____

(12) ___ (14)

APPENDIX B

SYMPTOM ATTRIBUTION SURVEY

An interview schedule to assess the cognitions and behaviors of making attributions for physical symptoms

James M. Sinacore
Loyola University of Chicago
Department of Psychology

2-(1) _ _ _ _ _ _ (6) (7) (8) _ _ (10) (11) (12)

Date________________ Subject number_____________

Interviewer ____

Form sas-011287

INTRODUCTION

This interview deals with the experience of bodily sensations and physical symptoms. I would like to talk with you for a few minutes about the symptoms that you have experienced within the last 3 to 4 weeks. I am interested in how you as an individual think about your symptoms--so there are no right or wrong answers to the questions that I am going to ask you. I'd like you to respond to my questions in any way that reflects your personal understanding of your symptoms.

In our discussion today I am using the word "symptom" to refer to any uncomfortable or unpleasant bodily sensation such as a headache, sore muscles, upset stomach, earache, and anything else like that. I also am using the word "symptom" to refer to any unusual change in body appearance or function such as hair loss, skin discoloration, blurred vision, painless lumps, and anything else like that.

As we continue our discussion, do not hesitate to stop me in order to clarify a question for you. It is important that you understand each question -- and answer it in terms of your own thinking. If you happen to think of something along the way that you forgot to mention earlier, just tell me and I'll go back and modify any of your answers.

Do you have any questions before we get started?

Start Time: ________________

__ (13) __ __ (14)(15) __ (16)

01. As you know, there are times when we experience a single symptom -- and there are times when we experience a number of symptoms all at the same time. For our discussion today I'd like you to think about your experience with a symptom or set of symptoms that occurred sometime within the last 3 to 4 weeks.

Please tell me what the symptom or symptoms were.

(17) (18) _ _ _ _ _ _ _ _ _ _ _ (29)

During the interview, I want us to talk about the most recent occurrence of this symptomatic experience. Please do not refer to earlier occurrences unless I ask you to.

02. About how long ago did the symptom(s) start to appear?

(30)(31)

03. Are you still feeling the symptom(s)?

1 -- yes **[go to Q. 4]**
2 -- no *

(32)

*** [If single symptom go to Q. 6]**
*** [If multiple symptoms go to Q. 5]**

04. In your estimation, about how how far along are you in terms of the course of your symptom(s)? Would you say that you are at the begining, -- toward the middle, -- or toward the end?

1 -- begining
2 -- middle
3 -- end

(33)

I realize that you are still experiencing your symptom(s) to some degree, but during our discussion I'll refer to it (them) in the past tense. This is because most people who I am talking with are no longer feeling their symptom. If this becomes confusing, just stop me and I'll try to rephrase my question. Is that OK? *

*** [If single symptom go to Q. 6]**
*** [If multiple symptoms go to Q. 5]**

05. Do you think that your symptoms were related in some way? In other words, do you think that your symptoms were interconnected?

1 -- yes (34)
2 -- no **[circle symptom that subject will talk about and go to Q.6]**

Since you feel that these symptoms were interconnected, I will refer to them as a symptom cluster as we continue our discussion. Is that OK?

06. I would like you to tell me a few facts about your symptom (cluster). I am particularly interested in the following.

(a) Using the response scale on page 1 of your handout, select a number that indicates how much physical discomfort your symptom (cluster) caused you. Please note that a 1 indicates "very little discomfort" -- and 10 indicates "a lot of discomfort."

1 2 3 4 5 6 7 8 9 10

(35)

(b) About how long did the symptom (cluster) last?
[If symptom is still present, ask instead: How long has your symptom (cluster) lasted?]

(36)(37) (38)(39)

(c) Using the response scale on page 2 of your handout, select a number that indicates how serious you thought your symptom (cluster) was. Please note that a 1 indicates "not very serious" -- and 10 indicates "very serious."

1 2 3 4 5 6 7 8 9 10

(40)

(d) Were there any common or routine activities -- no matter how small -- that your symptom (cluster) made difficult or unusually hard to do?

1 -- yes (41)
2 -- no **[go to Q. 7]**

(e) What activities were affected, and in what way were they affected?

(42) — (44)

07. Have you experienced this symptom (cluster) before? (45)

1 -- yes
2 -- no **[go to Q. 11]**

08. Using the response scale on page 3 of your handout, select the letter that indicates about how often you experience this symptom (cluster).

A	B	C	D	E
1	2	3	4	5

(46)

09. Do you think that your recent experience with this symptom (cluster) was similar to previous experiences, or was it different in some way?

1 -- similar **[go to Q. 11]**
2 -- different

(47)

10. In what way was it different?

(48) — (50)

11. **In general**, do you think that __[STATE SYMPTOM (CLUSTER)]__ is caused by one factor -- or can it be caused by more than one factor?

1 -- multiple factors **[go to Q. 17]**
2 -- single factor

(51)

12. What do you think is the sole cause of __[STATE SYMPTOM (CLUSTER)]__?

CAUSE #1______________________________ (SKIP)

I am now going to give you a form -- and would like you rate this cause on a number of different scales. Please read all the directions carefully -- and take as much time as you need. Don't hesitate to ask me any questions.

13. When you first experienced your symptom (cluster) did you think that **cause #1** was the cause if it?

(52)

1 -- yes **[go to Q. 23]**
2 -- no

14. Since you feel that __**[STATE SYMPTOM (CLUSTER)]**__ is caused only by **cause #1**, why do you think that it did not come to mind when you first began to experience the symptom?

(53) (55)

15. Did **cause #1** come to mind at a later time?

1 -- yes (56)
2 -- no **[STOP -- END THE INTERVIEW]**

16. About how long after you began to experience your symptom (cluster) did you think that **cause #1** was the cause? *

(57)(58)

* **[go to Q. 23]**

17. I'd like you to take a few minutes and think about the causes of __[STATE SYMPTOM (CLUSTER)]__. Tell me out loud what you think the causes are -- and I'll write them down as you say them. Please say **anything** that comes to your mind.
[number causes in the order given by respondent]
[prompt: Anything else?]

(59)(60)

18. When you first experienced your symptom (cluster) did you think about what was causing it?

1 -- yes **[go to Q. 22]**
2 -- no

(61)

19. Since you feel that __[STATE SYMPTOM (CLUSTER)]__ can be caused by a number of factors, why do you think that none of these factors came to mind when you first began to experience your symptom (cluster)?

(62) (64)

20. Did you think about a cause at a later time?

(65)

1 -- yes
2 -- no **[STOP -- END THE INTERVIEW]**

21. About how long after you began to experience your symptom (cluster) did you think about what was causing it?

(66) (67)

22. What was the very first cause that you thought about?

CAUSE #1 ______________________________ (68)(69)

23. Were there any qualities of the symptom (cluster) such as its location, its level of discomfort, its duration or its behavior that led you to think that **cause #1** was the cause?

1 -- yes (70)
2 -- no **[go to Q. 25]**

24. What was or were the aspects of the symptom (cluster) that made you think about **cause #1**?

3-(1) ___ ___ ___ (4)

25. When you thought that **cause #1** might be the cause of your symptom (cluster), did you do anything to help relieve the symptom (cluster)?

1 -- yes ___ (5)
2 -- no **[go to Q. 30]**

26. Please tell me what kinds of things you did to help relieve your symptom when you thought that **cause #1** was the cause. If you did multiple things, try to remember the order in which you did them.

[prompt: Did you think that was helpful?]

________________________.................... yes no dk ___ (6)

________________________.................... yes no dk ___ (7)

________________________.................... yes no dk ___ (8)

________________________.................... yes no dk ___ (9)

________________________.................... yes no dk ___ (10)

________________________.................... yes no dk ___ (11)

27. Sometimes the things we do to relieve our symptoms work, other times they do not. Would you say that the result of your action(s) to relieve your symptom (cluster) tended to make you **doubt** that **cause #1** was the cause -- would you say that the result of your action(s) tended to **support** the fact that **cause #1** was the cause -- or would you say that the result of your action(s) didn't affect your thinking in either way?

1 -- doubt cause (12)
2 -- support cause **[go to Q. 29]**
3 -- no effect **[go to Q. 31]**

28. Why do you think that the result of your action(s) tended to make you doubt that **cause #1** was the cause of your symptom (cluster)? *

(13) (15)

* **[go to Q. 31]**

29. Why do you think that the result of your action(s) tended to support the fact that **cause #1** was the cause of your symptom (cluster)? *

(16) (18)

* **[go to Q. 31]**

30. Why didn't you try to relieve your symptom (cluster) in some way?

(19) — (21)

31. There are times when we experience a symptom and think that we are sick -- there are other times when we have a symptom and do **not** think that we are sick. When you thought that your symptom (cluster) might be caused by **cause #1**, did you think of yourself as being sick?

1 -- yes (22)
2 -- no **[go to Q. 33]**

32. What was it that made you think that you were sick? *

(23) — (25)

* **[go to Q. 34]**

33. Why is it that you did not see yourself as being sick?

(26) — (28)

34. Did you talk with any nonmedical person -- such as a friend or relative -- about your symptom (cluster) when you thought that **cause #1** was the cause?

1 -- yes (29)
2 -- no **[go to Q. 48]**

35. How many nonmedical people did you talk with at this time?

__________ (30)(31)

Using the list on page 4 of your handout, please identify the person or persons who you spoke with. Just call off the letter or letters that apply to you.

	A	B	C	D	E	F	G	H	I*
Frequency	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)

* **[If I ask:** Who was that? ________ ________ ________**]**

[If respondent identifies more than one person, then read]
I know that you spoke with more than one person, but for our discussion today I would like to talk with you **only** about the **first** person you talked with.

36. Did you talk with this person with the intention of discussing your symptom (cluster)?

1 -- yes
2 -- no

(41)

37. During your conversation, did this person tell you what he or she thought might be causing your symptom (cluster)?

1 -- yes (42)
2 -- no **[go to Q 41]**

38. Did he or she think that your symptom was caused by **cause #1**?

1 -- yes
2 -- no **[go to Q 45]**

(43)

39. Did this tend to make you think more strongly that **cause #1** was the cause of your symptom (cluster)?

(44)

1 -- yes **[go to Q. 48]**
2 -- no

40. Why not? *

(45) — (47)

* **[go to Q. 48]**

41. Was there anything that this person said that **in some way** made you think more strongly that **cause #1** was the cause of your symptom (cluster)?

1 -- yes
2 -- no **[go to Q. 43]**

(48)

42. What did he or she say? *

(49) — (51)

* **[go to Q. 48]**

43. Was there anything that this person said that **in some way** made you start to doubt that **cause #1** was the cause of your symptom (cluster)?

1 -- yes (52)
2 -- no **[go to Q. 48]**

44. What did he or she say? *

(53) — (55)

* **[go to Q. 48]**

45. What did this person think was causing your symptom (cluster)?

(56) — (58)

46. Did this tend to make you doubt that **cause #1** was the cause of your symptom (cluster)?

(59)

1 -- yes **[go to Q. 48]**
2 -- no

47. Why not?

(60) — (62)

48. Did you visit a doctor or nurse to discuss your symptom (cluster) when you thought that **cause #1** was the cause?

1 -- yes (63)
2 -- no **[go to Q. 57]**

49. **[read only if Q. 34 is yes]**
Did you visit a medical person before -- or after you spoke with a friend regarding your symptom (cluster)?

1 -- before
2 -- after (64)

50. Why did you decide to go to a health professional?

(65) — (67)

51. Did the doctor or nurse think that your symptom (cluster) was caused by **cause #1**?

1 -- yes (68)
2 -- no **[go to Q. 54]**
3 -- don't know **[go to Q. 57]**

52. Did this tend to make you think more strongly that **cause #1** was the cause of your symptom (cluster)?

(69)

1 -- yes **[go to Q. 57]**
2 -- no

53. Why not? *

(70) — (72)

* **[go to Q. 57]**

54. What did the doctor or nurse think was causing your symptom (cluster)?

4-(1) — — (4)

55. Did this tend to make you doubt that **cause #1** was the cause of your symptom (cluster)?

(5)

1 -- yes **[go to Q. 57]**
2 -- no

56. Why not? *

(6) — (8)

57. When you thought that **cause #1** was causing your symptom, did you refer to any type of medical guide to do some reading on the subject?

1 -- yes (9)
2 -- no **[go to Q. 62]**

58. Did you find any information that tended to make you feel more strongly that **cause #1** was the cause of your symptom?

1 -- yes (10)
2 -- no **[go to Q. 60]**

59. What did you read?

(11) — (13)

* **[go to Q. 62]**

60. Did you find any information that tended to make you doubt that **cause #1** was the cause of your symptom?

1 -- yes (14)
2 -- no **[go to Q. 62]**

61. What did you read?

(15) (17)

62. Overall, what would you say it was that gave you the clue to think that **cause #1** might be the cause of your symptom?

1 -- *[if answered]* **[go to Q. 63]** (18)
2 -- *[if not answered]* **[go to Q. 64]**

63. What was it?

(19) (21)

64. Was there anything that gave you the impression to think that perhaps **cause #1** might **not** be the cause of your symptom?

1 -- yes (22)
2 -- no **[go to Q. 66]**

65. What was it?

(23) (25)

66. After you thought about **cause #1**, did you think about any other cause that might account for your symptom (cluster)?

(26)

1 -- yes **[go to Q. 68]**
2 -- no *

* **[If respondent believes in only single cause go to Q. 159, else go to Q. 67]**

67. You said earlier that STATE SYMPTOM (CLUSTER) can be caused by more than one factor, yet when you experienced your symptom (cluster) you only considered **cause #1**. Why do you think that other causes didn't come to mind?

(27) (29)

* **[go to Q. 159]**

68. What was the second cause that you thought of -- that is, what was the cause that you thought of **after** you thought of **cause #1**?

CAUSE #2________________________________ (30)(31)

69. Were there any qualities of the symptom (cluster) such as its location, its level of discomfort, its duration, or its behavior that led you to think that **cause #2** was the cause?

1 -- yes (32)
2 -- no **[go to Q. 71]**

70. What was or were the aspects of the symptom (cluster) that made you think about **cause #2**?

(33) (35)

71. When you thought that **cause #2** might be the cause of your symptom (cluster), did you do anything to help relieve the symptom (cluster)?

1 -- yes (36)
2 -- no **[go to Q. 76]**

72. Please tell me what kinds of things you did to help relieve your symptom when you thought that **cause #2** was the cause. If you did multiple things, try to remember the order in which you did them.

[prompt: Did you think that was helpful?**]**

______________________ .... yes no dk __ (37)

______________________ .... yes no dk __ (38)

______________________ .... yes no dk __ (39)

______________________ .... yes no dk __ (40)

______________________ .... yes no dk __ (41)

______________________ .... yes no dk __ (42)

73. Sometimes the things we do to relieve our symptoms work, other times they do not. Would you say that the result of your action(s) to relieve your symptom (cluster) tended to made you **doubt** that **cause #2** was the cause -- would you say that the result of your action(s) tended to **support** the fact that **cause #2** was the cause -- or would you say that the result of your action(s) didn't affect your thinking in either way?

1 -- doubt cause __ (43)
2 -- support cause **[go to Q. 75]**
3 -- no effect **[go to Q. 77]**

74. Why do you say that the result of your action(s) tended to make you doubt that **cause #2** was the cause of your symptom (cluster)? *

__ (44) __ __ (46)

* **[go to Q. 77]**

75. Why do you say that the result of your action(s) tended to support the fact that **cause #2** was the cause of your symptom (cluster)? *

(47) — (49)

* **[go to Q. 77]**

76. Why didn't you try to relieve your symptom (cluster) in some way?

(50) — (52)

77. There are times when we experience a symptom and think that we are sick -- there are other times when we have a symptom and do **not** think that we are sick. When you thought that your symptom (cluster) was caused by **cause #2**, did you think of yourself as being sick?

1 -- yes (53)
2 -- no **[go to Q. 79]**

78. What was it that made you think that you were sick? *

(54) __ (56)

* **[go to Q. 80]**

79. Why is it that you did not see yourself as being sick?

(57) __ (59)

80. Did you talk with any nonmedical person -- such as a friend or relative -- about your symptom (cluster) when you thought that **cause #2** was the cause?

1 -- yes (60)
2 -- no **[go to Q. 94]**

81. How many nonmedical people did you talk with at this time?

______________ (61)(62)

Using the list on page 4 of your handout, please identify the person or persons who you spoke with. Just call off the letter or letters that apply to you.

	A	B	C	D	E	F	G	H	I*
Frequency	(63)	(64)	(65)	(66)	(67)	(68)	(69)	(70)	(71)

* **[If I ask:** Who was that? __________ __________ __________**]**

[If respondent identifies more than one person, then read]
I know that you spoke with more than one person, but for our discussion today I would like to talk with you **only** about the **first** person you talked with.

82. Did you talk with this person with the intention of discussing your symptom (cluster)?

1 -- yes
2 -- no

5-(1) (2)

83. During your conversation, did this person tell you what he or she thought might be causing your symptom (cluster)?

1 -- yes (3)
2 -- no **[go to Q 87]**

84. Did he or she think that your symptom was caused by **cause #2**?

1 -- yes (4)
2 -- no **[go to Q 91]**

85. Did this tend to make you think more strongly that **cause #2** was the cause of your symptom (cluster)?

(5)

1 -- yes **[go to Q. 94]**
2 -- no

86. Why not? *

(6) (8)

* **[go to Q. 94]**

87. Was there anything that this person said that **in some way** made you think more strongly that **cause #2** was the cause of your symptom (cluster)?

1 -- yes (9)
2 -- no **[go to Q. 89]**

88. What did he or she say? *

(10) — (12)

* **[go to Q. 94]**

89. Was there anything that this person said that **in some way** made you start to doubt that **cause #2** was the cause of your symptom (cluster)?

1 -- yes (13)
2 -- no **[go to Q. 94]**

90. What did he or she say? *

(14) — (16)

* **[go to Q. 94]**

91. What did this person think was causing your symptom (cluster)?

(17) (19)

92. Did this tend to make you doubt that **cause #2** was the cause of your symptom (cluster)?

(20)

1 -- yes **[go to Q. 94]**
2 -- no

93. Why not?

(21) (23)

94. Did you visit a doctor or nurse to discuss your symptom (cluster) when you thought that **cause #2** was the cause?

1 -- yes
2 -- no **[go to Q. 103]**

(24)

95. **[read only if Q. 80 is yes]**
Did you visit a medical person before -- or after you spoke with a friend regarding your symptom (cluster)?

1 -- before
2 -- after

(25)

96. Why did you decide to go to a health professional?

(26) (28)

97. Did the doctor or nurse think that your symptom (cluster) was caused by **cause #2**?

1 -- yes (29)
2 -- no **[go to Q. 100]**
3 -- don't know **[go to Q. 103]**

98. Did this tend to make you think more strongly that **cause #2** was the cause of your symptom (cluster)? (30)

1 -- yes **[go to Q. 103]**
2 -- no

99. Why not? *

(31) — (33)

* **[go to Q. 103]**

100. What did the doctor or nurse think was causing your symptom (cluster)?

(34) — (36)

101. Did this tend to make you doubt that **cause #2** was the cause of your symptom (cluster)? (37)

1 -- yes **[go to Q. 103]**
2 -- no

102. Why not?

(38) — (40)

103. When you thought that **cause #2** was causing your symptom, did you refer to any type of medical guide to do some reading on the subject?

1 -- yes (41)
2 -- no **[go to Q. 108]**

104. Did you find any information that tended to make you feel more strongly that **cause #2** was the cause of your symptom?

1 -- yes (42)
2 -- no **[go to Q. 106]**

105. What did you read?

(43) — (45)

* **[go to Q. 108]**

106. Did you find any information that tended to make you doubt that **cause #2** was the cause of your symptom?

1 -- yes (46)
2 -- no **[go to Q. 108]**

107. What did you read?

(47) — (49)

108. Overall, what would you say it was that gave you the clue to think that **cause #2** might be the cause of your symptom?

1 -- *[if answered]* **[go to Q. 109]** (50)
2 -- *[if not answered]* **[go to Q. 110]**

109. What was it?

(51) (53)

110. Was there anything that gave you the impression to think that perhaps **cause #2** might **not** be the cause of your symptom?

1 -- yes (54)
2 -- no **[go to Q. 112]**

111. What was it?

(55) (57)

112. After you thought about **cause #2**, did you think about any other cause that might account for your symptom (cluster)?

1 -- yes (58)
2 -- no **[go to Q. 159]**

113. What was the third cause that you thought of -- that is, what was the cause that you thought of **after** you thought of **cause #2**?

CAUSE #3________________________________ (59)(60)

114. Were there any qualities of the symptom (cluster) such as its location, its level of discomfort, its duration, or its behavior that led you to think that **cause #3** was the cause?

1 -- yes
2 -- no **[go to Q. 116]**

(61)

115. What was or were the aspects of the symptom (cluster) that made you think about **cause #3?**

(62) (64)

116. When you thought that **cause #3** might be the cause of your symptom (cluster), did you do anything to help relieve the symptom (cluster)?

1 -- yes
2 -- no **[go to Q. 121]**

(65)

117. Please tell me what kinds of things you did to help relieve your symptom when you thought that **cause #3** was the cause. If you did multiple things, try to remember the order in which you did them.

[prompt: Did you think that was helpful?]

______________________________.................... yes no dk __ __
6-(1)(2)

______________________________.................... yes no dk __
(3)

______________________________.................... yes no dk __
(4)

______________________________.................... yes no dk __
(5)

______________________________.................... yes no dk __
(6)

______________________________.................... yes no dk __
(7)

118. Sometimes the things we do to relieve our symptoms work, other times they do not. Would you say that the result of your action(s) to relieve your symptom (cluster) tended to made you **doubt** that **cause #3** was the cause -- would you say that the result of your action(s) tended to **support** the fact that **cause #3** was the cause -- or would you say that the result of your action(s) didn't affect your thinking in either way?

1 -- doubt cause (8)
2 -- support cause **[go to Q. 120]**
3 -- no effect **[go to Q. 122]**

119. Why do you say that the result of your action(s) tended to make you doubt that **cause #3** was the cause of your symptom (cluster)? *

(9) __ (11)

* **[go to Q. 122]**

120. Why do you say that the result of your action(s) tended to support the fact that **cause #3** was the cause of your symptom (cluster)? *

(12) — (14)

* **[go to Q. 122]**

121. Why didn't you try to relieve your symptom (cluster) in some way?

(15) — (17)

122. There are times when we experience a symptom and think that we are sick -- there are other times when we have a symptom and do **not** think that we are sick. When you thought that your symptom (cluster) was caused by **cause #3**, did you think of yourself as being sick?

1 -- yes (18)
2 -- no **[go to Q. 124]**

123. What was it that made you think that you were sick? *

(19) __ (21)

* **[go to Q. 125]**

124. Why is it that you did not see yourself as being sick?

(22) __ (24)

125. Did you talk with any nonmedical person -- such as a friend or relative -- about your symptom (cluster) when you thought that **cause #3** was the cause?

1 -- yes (25)
2 -- no **[go to Q. 139]**

126. How many nonmedical people did you talk with at this time?

____________ (26)(27)

Using the list on page 4 of your handout, please identify the person or persons who you spoke with. Just call off the letter or letters that apply to you.

	A	B	C	D	E	F	G	H	I*
Frequency	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)

* **[If I ask:** Who was that? __________ __________ __________**]**

[If respondent identifies more than one person, then read]
I know that you spoke with more than one person, but for our discussion today I would like to talk with you **only** about the **first** person you talked with.

127. Did you talk with this person with the intension of discussing your symptom (cluster)?

1 -- yes
2 -- no (37)

128. During your conversation, did this person tell you what he or she thought might be causing your symptom (cluster)?

1 -- yes (38)
2 -- no **[go to Q 132]**

129. Did he or she think that your symptom was caused by **cause #3**?

1 -- yes (39)
2 -- no **[go to Q 136]**

130. Did this tend to make you think more strongly that **cause #3** was the cause of your symptom (cluster)?

(40)

1 -- yes **[go to Q. 139]**
2 -- no

131. Why not? *

(41) — (43)

* **[go to Q. 139]**

132. Was there anything that this person said that **in some way** made you think more strongly that **cause #3** was the cause of your symptom (cluster)?

1 -- yes (44)
2 -- no **[go to Q. 134]**

133. What did he or she say? *

(45) — (47)

* **[go to Q. 139]**

134. Was there anything that this person said that **in some way** made you start to doubt that **cause #3** was the cause of your symptom (cluster)?

1 -- yes (48)
2 -- no **[go to Q. 139]**

135. What did he or she say? *

(49) — (51)

* **[go to Q. 139]**

136. What did this person think was causing your symptom (cluster)?

(52) — (54)

137. Did this tend to make you doubt that **cause #3** was the cause of your symptom (cluster)?

(55)

1 -- yes **[go to Q. 139]**
2 -- no

138. Why not?

(56) — (58)

139. Did you visit a doctor or nurse to discuss your symptom (cluster) when you thought that **cause #3** was the cause?

1 -- yes (59)
2 -- no **[go to Q. 148]**

140. **[read only if Q. 125 is yes]**
Did you visit a medical person before -- or after you spoke with a friend regarding your symptom (cluster)?

1 -- before
2 -- after (60)

141. Why did you decide to go to a health professional?

(61) — (63)

142. Did the doctor or nurse think that your symptom (cluster) was caused by **cause #3**?

1 -- yes
2 -- no **[go to Q. 145]**
3 -- don't know **[go to Q. 148]**

7-(1)(2)

143. Did this tend to make you think more strongly that **cause #3** was the cause of your symptom (cluster)?

(3)

1 -- yes **[go to Q. 148]**
2 -- no

144. Why not? *

(4) (6)

* **[go to Q. 148]**

145. What did the doctor or nurse think was causing your symptom (cluster)?

(7) (9)

146. Did this tend to make you doubt that **cause #3** was the cause of your symptom (cluster)?

(10)

1 -- yes **[go to Q. 148]**
2 -- no

147. Why not? *

(11) (13)

148. When you thought that **cause #3** was causing your symptom, did you refer to any type of medical guide to do some reading on the subject?

1 -- yes (14)
2 -- no **[go to Q. 153]**

149. Did you find any information that tended to make you feel more strongly that **cause #3** was the cause of your symptom?

1 -- yes (15)
2 -- no **[go to Q. 151]**

150. What did you read?

(16) — (18)

* **[go to Q. 153]**

151. Did you find any information that tended to make you doubt that **cause #3** was the cause of your symptom?

1 -- yes (19)
2 -- no **[go to Q. 153]**

152. What did you read?

(20) — (22)

153. Overall, what would you say it was that gave you the clue to think that **cause #3** might be the cause of your symptom?

1 -- *[if inswered]* **[go to Q. 154]** (23)
2 -- *[if not answered]* **[go to Q. 155]**

154. What was it?

(24) — (26)

155. Was there anything that gave you the impression to think that perhaps **cause #3** might **not** be the cause of your symptom?

1 -- yes (27)
2 -- no **[go to Q. 157]**

156. What was it?

(28) — (30)

157. After you thought about **cause #3**, did you think about any other cause that might account for your symptom (cluster)?

1 -- yes (31)
2 -- no **[go to Q. 159]**

158. Please tell me what the cause or causes were. If you thought about more than one more cause, try to remember the order in which you thought about them. **[prompt:** anything else?]

CAUSE #4 ______________________________ __ __ (32)(33)

CAUSE #5 ______________________________ __ __ (34)(35)

CAUSE #6 ______________________________ __ __ (36)(37)

CAUSE #7 ______________________________ __ __ (38)(39)

CAUSE #8 ______________________________ __ __ (40)(41)

CAUSE #9 ______________________________ __ __ (42)(43)

CAUSE #10 ______________________________ __ __ (44)(45)

159. I assume, then, that **cause #last** was the last cause that you considered. Is that right? __ (46)

1 -- yes **[go to Q. 161]**
2 -- no

160. What was the last cause that you thought about?

______________________________ (skip)

161. This concludes our discussion regarding your symptom (cluster). Would you like me to go back and change or modify any of your answers? __ (47)

1 -- yes **[modify answers then STOP]**
2 -- no **[STOP]**

End Time: ____________________

APPENDIX C

very little discomfort										a lot of discomfort
	1	2	3	4	5	6	7	8	9	10

not very serious	very serious

1 2 3 4 5 6 7 8 9 10

A	B	C	D	E
have never or almost never experienced the symptom	less than 3 or 4 times per year	every month or so	every week or so	more than once every week

A -- coworker
B -- friend
C -- parent
D -- brother / sister
E -- other relative
F -- roommate
G -- clergy
H -- spouse
I -- other (please specify)

APPENDIX D

HEALTH OPINION SURVEY

The questions on the next two pages ask for your opinions about different kinds of health care. For each statement, decide whether you agree or disagree and circle the answer which best fits your opinion. Each person is different, so there are no "right" or "wrong" answers. Please circle an answer for each question. **Do not leave any blank.** Even if you find that you don't completely agree or disagree with a statement, choose the one answer that comes closest to what you believe.

If you have any questions, please ask the study coordinator.

For each question, circle the **one** answer that comes **closest** to what you believe

1. I usually don't ask the doctor or nurse many questions about what they're doing during a medical exam.	Agree	Disagree	___12-(1)
2. Except for serious illness, it's generally better to take care of your own health than to seek professional help.	Agree	Disagree	___ (2)
3. I'd rather have doctors and nurses make the decisions about what's best than for them to give me a whole lot of choices.	Agree	Disagree	___ (3)
4. Instead of waiting for them to tell me, I usually ask the doctor or nurse immediately after an exam about my health.	Agree	Disagree	___ (4)
5. It is better to rely on the judgements of doctors (who are experts) then to rely on "common sense" in taking care or your own body.	Agree	Disagree	___ (5)
6. Clinics and hospitals are good places to go for help since it's best for medical experts to take responsibility for health-care.	Agree	Disagree	___ (6)
7. Learning how to cure some of your illness without contacting a physician is a good idea.	Agree	Disagree	___ (7)
8. I usually ask the doctor or nurse lots of questions about the procedures during a medical exam.	Agree	Disagree	___ (8)
9. It's almost always better to seek professional help than to try to treat yourself.	Agree	Disagree	___ (9)
10. It's better to trust the doctor or nurse in charge of a medical procedure than to question what they are doing.	Agree	Disagree	___(10)
11. Learning how to cure some of your illness without contacting a physician may create more harm than good.	Agree	Disagree	___(11)
12. Recovery is usually quicker under the care of a doctor or nurse than when patients take care of themselves.	Agree	Disagree	___(12)

13. If it costs the same, I'd rather have a doctor or nurse give me treatments than to do the same treatments myself.	Agree	Disagree	___ (13)
14. It is better to rely less on physicians and more on your own common sense when it comes to caring for your body.	Agree	Disagree	___ (14)
15. I usually wait for the doctor or nurse to tell me about the results of a medical exam rather than asking them immediately.	Agree	Disagree	___ (15)
16. I'd rather be given many choices about what's best for my health than to have the doctor make the decisions for me.	Agree	Disagree	___ (16)

APPENDIX E

SYMPTOM CHECKLIST

On the following pages, several common symptoms or bodily sensations are listed. Most people have experienced most of these feelings at one time or another. We are currently interested in discovering how prevalent each symptom is among college students. All information will be considered confidential.

DIRECTIONS

Please read each of the symptoms on the next few pages and circle the letter which indicates how frequently you experience that symptom. Use the following scale for each symptom.

A	B	C	D	E
Have never or almost never experienced the symptom	Less than 3 or 4 times per year	Every month or so	Every week or so	More than once every week

For example, if your eyes tend to water once every week or two, you would circle letter D.

There are no "right" or "wrong" answers to this task. Please respond to each symptom in terms of your own experience. If you have any questions, please ask the study coordinator.

	A Have never or almost never experienced the symptom	B Less than 3 or 4 times per year	C Every month or so	D Every week or so	E More than once every week		
1. Eyes water	A	B	C	D	E	__	10-(1)
2. Itching or painful eyes	A	B	C	D	E	__	(2)
3. Ringing in ears	A	B	C	D	E	__	(3)
4. Temporary deafness or hard of hearing	A	B	C	D	E	__	(4)
5. lump in throat	A	B	C	D	E	__	(5)
6. Choking sensations	A	B	C	D	E	__	(6)
7. Sneezing spells	A	B	C	D	E	__	(7)
8. Running nose	A	B	C	D	E	__	(8)
9. Congested nose	A	B	C	D	E	__	(9)
10. Bleeding nose	A	B	C	D	E	__	(10)
11. Asthma or wheezing	A	B	C	D	E	__	(11)
12. Coughing	A	B	C	D	E	__	(12)
13. Out of breath	A	B	C	D	E	__	(13)
14. Swollen ankles	A	B	C	D	E	__	(14)
15. Chest Pains	A	B	C	D	E	__	(15)
16. Racing heart	A	B	C	D	E	__	(16)
17. Cold hands and feet, even in hot weather	A	B	C	D	E	__	(17)
18. Leg Cramps	A	B	C	D	E	__	(18)
19. Insomnia	A	B	C	D	E	__	(19)
20. Toothaches	A	B	C	D	E	__	(20)
21. Upset stomach	A	B	C	D	E	__	(21)

A	B	C	D	E
Have never or almost never experienced the symptom	Less than 3 or 4 times per year	Every month or so	Every week or so	More than once every week

22. Indigestion	A	B	C	D	E	__	(22)
23. Heartburn	A	B	C	D	E	__	(23)
24. Severe pains or cramps in stomach	A	B	C	D	E	__	(24)
25. Diarrhea	A	B	C	D	E	__	(25)
26. Constipation	A	B	C	D	E	__	(26)
27. Hemorrhoids	A	B	C	D	E	__	(27)
28. Swollen joints	A	B	C	D	E	__	(28)
29. Stiff muscles	A	B	C	D	E	__	(29)
30. Back pains	A	B	C	D	E	__	(30)
31. Sensitive or tender skin	A	B	C	D	E	__	(31)
32. Face flushes	A	B	C	D	E	__	(32)
33. Severe itching	A	B	C	D	E	__	(33)
34. Skin breaks out in a rash	A	B	C	D	E	__	(34)
35. Acne or pimples on face	A	B	C	D	E	__	(35)
36. Acne or pimples other than face	A	B	C	D	E	__	(36)
37. Boils	A	B	C	D	E	__	(37)
38. Sweat, even in cold weather	A	B	C	D	E	__	(38)
39. Strong reactions to insect bites	A	B	C	D	E	__	(39)
40. Headaches	A	B	C	D	E	__	(40)
41. Sensation of pressure in head	A	B	C	D	E	__	(41)
42. Hot flashes	A	B	C	D	E	__	(42)

	A Have never or almost never experienced the symptom	B Less than 3 or 4 times per year	C Every month or so	D Every week or so	E More than once every week		
43. Chills	A	B	C	D	E	__	(43)
44. Dizziness	A	B	C	D	E	__	(44)
45. Feel faint	A	B	C	D	E	__	(45)
46. Numbness or tingling in any part of body	A	B	C	D	E	__	(46)
47. Twitching of eyelid	A	B	C	D	E	__	(47)
48. Twitching other than eyelid	A	B	C	D	E	__	(48)
49. Hands tremble or shake	A	B	C	D	E	__	(49)
50. Stiff joints	A	B	C	D	E	__	(50)
51. Sore muscles	A	B	C	D	E	__	(51)
52. Sore throat	A	B	C	D	E	__	(52)
53. Sunburn	A	B	C	D	E	__	(53)
54. Nausea	A	B	C	D	E	__	(54)

APPENDIX F

BODY PERCEPTION QUESTIONNAIRE

The statements on the next page are about the perceptions of one's body. Please rate each of these statements in terms of how characteristic thay are of your own perceptions. Each statement should be rated on the scale that goes from 0 (extremely uncharacteristic of me) to 4 (extremely characteristic of me). There are no right or wrong answers to this questionnaire so please make your ratings in accord with your own personal perceptions. **Be sure to rate all 15 statements.**

If you have any questions, please ask the study coordinator.

	extremely uncharacteristic of me				extremely characteristic of me	
1. I am sensitive to internal bodily tensions.	0	1	2	3	4	11-(1)
2. I think a lot about my body build.	0	1	2	3	4	(2)
3. I am concerned about my posture.	0	1	2	3	4	(3)
4. I like to make sure that my hair looks right.	0	1	2	3	4	(4)
5. I know immediately when my mouth or throat gets dry.	0	1	2	3	4	(5)
6. I'm beter coordinated than most people.	0	1	2	3	4	(6)
7. I'm very aware of changes in my body temperature.	0	1	2	3	4	(7)
8. I can often feel my heart beating.	0	1	2	3	4	(8)
9. For my size, I'm pretty strong.	0	1	2	3	4	(9)
10. It's important for me that my skin looks nice ... for example, has no blemishes.	0	1	2	3	4	(10)
11. I am quick to sense the hunger contractions in my stomach.	0	1	2	3	4	(11)
12. I'm capable of moving quickly.	0	1	2	3	4	(12)
13. When with others, I want my hands to be clean and look nice.	0	1	2	3	4	(13)
14. I'm light on my feet compared to most people.	0	1	2	3	4	(14)
15. I'm very aware of my best and worst facial features.	0	1	2	3	4	(15)

APPROVAL SHEET

The dissertation submitted by James M. Sinacore has been read and approved by the following committee:

Dr. Emil J. Posavac, Director
Professor and Chairperson, Psychology, Loyola

Dr. John D. Edwards
Associate Professor, Loyola

Dr. Fred B. Bryant
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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

20 April 1989
Date

Director's Signature