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City University of New York, 1992

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PREMATURE PARENTAL DEATH, SUBJECTIVE LIFE EXPECTANCY, AND HEALTH BEHAVIOR

by

VERONIKA DENES-RAJ

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1992

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November 11, 1991
Date

Howard Ehrlichman
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Abstract

PREMATURE PARENTAL DEATH, SUBJECTIVE LIFE EXPECTANCY, AND HEALTH BEHAVIOR

by

Veronika Denes-Raj

Adviser: Professor Howard Ehrlichman

Subjective life expectancy and health behavior were assessed in 167 college students with at least one parent who died prematurely (age 55 or younger) due to illnesses that are commonly believed to involve some genetic predisposition (PD group) and in 167 matched subjects with both parents alive and healthy (PH_1 group). In addition, subjective life expectancy and health behavior were assessed in 202 college students whose parents were alive but developed an illness before the age of 55 that the subject perceived as life-threatening (PI group) and in 202 matched subjects whose parents were healthy (PH_2 group). PD subjects anticipated a significantly shorter life span as compared to matched controls. In addition, they expected to live a shorter life than they believed comparable others would live. These differences were observed for both "objective" judgments (rational) and "gut feelings" (experiential).

Subjective life expectancy of PI subjects was significantly lower that of their controls, but significantly higher that of subjects who have lost a parent prematurely. These results were obtained with both the "rational" with the "experiential" items. PI subjects' projections of the age when they might develop a serious illness did not differ either on the rational or the experiential items from those of control subjects. PD subjects reported poorer health habits than matched controls: they exercised less, smoked more, and monitored their calorie intake less conscientiously. PI subjects did not differ from control subjects on any of the self-reported health behaviors. Subjects beliefs concerning the likelihood that they would die of the same cause as their parent, or develop the same life threatening illness were unrelated to life span predictions or health behavior. There were also no significant associations have been found between subjective life expectancy and the age of the subject at the time of parental death, the particular illness the parent died of, nor the gender match between subject and the deceased parent.

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INTRODUCTION

OVERVIEW

During the past few decades, there has been a good deal of interest in the consequences of early bereavement. Many attempts have been made to assess the possible influences of premature parental death on personality development, social adjustment, and mental health. A view commonly held by developmental and clinical psychologists is that early bereavement itself is a serious impediment to the socio-emotional development of a child, and may lead to a multitude of pathological behaviors later in life.

Death is a central issue in all human existence, and the anticipation of death is believed to affect the quality of life. The way one conceptualizes death has significant implications for how one perceives, organizes and ultimately experiences one's life. The meaning of death, however, encompasses two distinctly different concepts, that of the "death of others" and the "death of myself". The two concepts first appear at different developmental stages and evoke different psychological processes. The "death of others" is an

occurrence within the world; it threatens social bounds, and evokes feelings of loss, deprivation, and insecurity. The "death of myself" refers to the annihilation of one's own world, the awareness of which can "transform the value of everything in life" (Koestenbaum, 1971) by eliciting an understanding of the temporal limits of one's existence.

The majority of prior investigations on the effects of early parental death have focused on the pathogenic consequences of the experience, and approached the phenomenon as it relates to the "death of others." Research by Denes and Ehrlichman (in press), working with non-clinical samples, suggested that early parental death may also be related to the "death of myself," with consequences that although not pathogenic, may have important implications for behavior and well-being. In their research, subjects whose parents died prematurely of natural causes had lower subjective life expectancy and poorer self-reported health behavior than subjects whose parents were still alive.

The purpose of the present research is fourfold. Primarily, its major goal was to establish more conclusively the link observed among premature parental death due to illnesses and reduced subjective life expectancy and poor health behavior (Denes &

Ehrlichman, in press). A second goal was to examine some variables which could influence an individual's subjective life expectancy following early parental death. A third goal was to explore whether or not the reversal of unrealistic optimism showed by subjects who lost a parent prematurely regarding subjective life expectancy would generalize to estimating risks for health hazards. The final goal was to examine whether the death of a parent is necessary to produce the above-mentioned results, or whether simply having a parent who prematurely developed a life threatening illness will similarly influence subjective life expectancy and/or health behavior.

HISTORICAL OVERVIEW

Death is a universal human experience, and throughout history people have tried to unravel its mysteries. Humankind's struggle to understand and/or circumvent death has been documented from the earliest recorded times, and these efforts most likely predate the written accounts. The topic of death has a long history in religion, philosophy, and literature. In the social sciences, anthropology has long addressed the role of death in culture (see Palgi and Abramovitch, 1984, for a review), and modern sociology has launched some attempts to account for the social dimensions of death (e.g., Bendiksen, 1976; Blauner, 1966; Durkheim, 1951). Although psychology emerged from social and philosophical traditions in which the problem of death was prominent, until the mid-20th century, with the exception of some scattered references in the psychoanalytic literature (e.g., Freud, 1956, 1959; Jung, 1934), the discipline by and large ignored the topic. Scientific interest in death-related behavior did not surface until the late 1950s, and for the next two decades the domain remained primarily the concern of a relatively small group of thanatologists. Research efforts during this period focused on the

correlates and consequences of death anxiety, the needs and treatment of the terminally ill, and the pathological consequences of bereavement. In a recent issue of the American Psychologist, Feifel (1990), a pioneer of the field, enumerated the external and internal factors responsible for the discipline's historical reluctance to address death-related questions. He summarized major findings, clinical applications, and perspectives emerging from the work of death researchers, and chided mainstream psychology for undervaluing the importance of death in the psychic economy. Ironically, while calling for the integration of thanatology into the main body of psychological research, Feifel's (1990) review of the literature was limited mainly to the works of clinicians and death researchers, ignoring the slow but steady interest emerging among social and personality psychologists. In fact, in the last few years several articles have appeared in leading scientific journals addressing death-related issues. The relationship between the fear of personal death and attribution structure (Florian and Kravitz, 1983), religious commitments (Florian, Kravitz & Frankel, 1984) and early attachment development (Mikulincer, Florian, & Tolmacz, 1990), as well as the influence of personal mortality salience on the judgments of moral transgressors (Rosenblatt, Greenberg,

Solomon, Pyszczynski, & Lyon, 1989), and stereotyping and in-group favoritism (Greenberg, Pyszczynski, Solomon, Rosenblatt, Veeder, Kirkland & Lyon, 1990) have been explored.

THE MEANINGS OF DEATH

There seems to be no unitary meaning of death. Rather, it is an exceedingly complex symbol with many implications and meanings that vary as a function of age, sex, health, intellectual ability, socio-economic status, and psychological level of discourse. Among the total constellation of meanings of death the primary distinction has been drawn between two basic types of meanings, the "death of another" and the "death of myself." These two meanings are conceptually and experientially separate entities (Koestenbaum, 1971; Nelson & Nelson, 1975) that develop at different times in the human life cycle (Kastenbaum & Aisenberg, 1976).

The "death of another" is conceived to be an occurrence within the world. Seen from the perspective of the observer, the "death of another" involves the elimination of an object within the observer's world, and it is basically experienced as a loss. The development of

the concept "death of another" precedes that of the "death of myself." The development of the "death of others" has been shown to parallel the emergence of operational thinking (e.g., Childers & Wimmer, 1971; Kane, 1979; Lonetto, 1980). Although controversy exists over the ages at which transitions in death concept development occur (Maurer, 1966), most investigators agree that evidence tends to converge on a single set of elements which is necessary for a mature concept of death: universality, inevitability, irrevocability, and finality. A mature concept of death based on these elements has not been observed in children younger than age seven and typically does not appear until the ages of ten or twelve (Lester & Kam, 1970; Kastenbaum & Aisenberg, 1976; Maurer, 1966; Nagy, 1959).

Individual differences in the conceptualization of the "death of another" have been shown to be influenced by cultural/religious background. Tallmer, Formanek, and Tallmer (1974) found that children from lower economic classes were more attuned to the concept of death, probably because death and violence are more frequent in their social milieu. Candy-Gibbs, Colby-Sharp, and Peturn (1985) found that religious background influenced the development

of the concept of death. These authors reported that northern Unitarian children between the ages of five and nine showed a clearer understanding of the irreversibility and inevitability of death than did southern Baptist children of the same age group. (The Unitarian religion stresses a biological explanation of life, and views death as the final stage of life in which biological functions cease, whereas Baptism stresses a deity-based explanation of life with the possibility of life after death in Heaven.) The history of the development of attachment bonds and experiences of early loss also has been proposed to account for differences in children's understanding of "death of others" (Bowlby, 1980; Feifel, 1959; Schoenfeld & Smilansky, 1989). The reaction to the "death of another" is believed to be the function of such factors as the abruptness and significance of the bereavement, incidental demands and responsibilities precipitated by the loss, and the availability of a substitute object as a replacement for the lost one (Averill, 1968).

The "death of myself" is the anticipated termination of any further experience with, or conception of, the world itself. It signifies the disintegration and dissolution, indeed the total annihilation of one's personal world. The individual him/herself vanishes, and

experientally our image of the "death of myself" is the end of the world. The confrontation with that threat is believed by some (e.g., Freud, 1959; Jung, 1934) to cause such extraordinary and unspeakable anxiety that people cannot comprehend it on a conscious level. Becker (1973) has proposed that the idea of personal death is a "mainspring of all human activity," activity designed to avoid death by denying its inevitability and finality. Following this line of reasoning Greenberg, Pyszczynski and Solomon (1990) have argued that human culture is essentially designed to buffer the anxiety over one's own mortality. These authors have suggested that the major role of cultural worldviews is to imbue subjective reality with order, meaning, and permanence and to offer a promise of symbolic immortality to those who fulfill the culture's prescriptions for being a valuable person. The attainment of some form of immortality has been theorized to be one of the basic human needs, "a compelling universal urge to maintain an inner sense of continuous symbolic relationship over time and space with the various elements of life" (Lifton, 1976, p. 31.). Lifton (1973) has proposed that while this need is present in all people, its expression may take different forms or "modes" in different cultures and in different individuals within a culture. In

Western societies this need has found expression most commonly in religious beliefs, aspirations for personal achievements which will survive the individual, and procreation. However, the belief in achieving an identification with the future through religious, creative, or biological "modes" of immortality has been demonstrated to be a strenuous, but only partially successful, effort to deny what the "death of myself" signifies, the total annihilation of the individual (Alexander & Alderstein, 1959; Faunce & Fulton, 1958; Lester, 1970; Feifel, 1974; Schoenrade, 1989; Templer & Dotson, 1970).

Without negating the influence of the dread of death on all human existence, proponents of an existentialist world view argue that it is not death itself, but the images of an incomplete, unfulfilled life, that arouse horror (Sartre, 1956; Kaufman, 1973; Rosenthal, 1973). Humanity's very essence rests in its unique awareness of personal mortality, and while the anticipation of death does affect the quality of human existence (Goodman, 1981), its impact is not necessarily paralyzing anxiety, but rather can be an intensified appreciation of the uniqueness and preciousness of life (Feifel, 1990). Since human aims and activities find meaning within the context of time, the awareness of one's inevitable death and the cognizance of

the temporal limitations of one's life both influence the individual's future time perspective, affecting goals and expectations for life (Wessman, 1973).

In the course of normal development, the concept of "death of myself", the realization of personal mortality, appears first in late adolescence but does not reach its mature form until decades later (Kastenbaum, 1959). According to Jacques (1965) a "central and crucial feature" of the mid-life crisis is the change in the individual's general concept of death from an event experienced in terms of the "death of another" to a personal matter, the "death of myself."

Although the "death of myself" and the "death of another" are clearly separate concepts that are elicited by different events, at times they can activate one another. Thoughts of "death of myself" can evoke concerns about dependents or loved ones, who will have to endure the loss (Kastenbaum & Aisenberg, 1972). Similarly, as the "death of myself" denotes the disintegration of one's world, the death of someone especially close - who makes up a large portion of one's world - may have many of the features of the "death of myself" (Koestenbaum, 1971).

EARLY PARENTAL DEATH AND "DEATH OF ANOTHER"

The death of a parent has been identified by researchers, as well as by the general public, as the most potent stressor of ordinary life for a child (Elliott & Eisendorfer, 1982). The exact number of young people who experience the death of a parent is unclear. It is estimated that approximately 1.5 million American children lose one or both parents by the age of fifteen (Kliman, 1979), and close to 3.5 million before their nineteenth birthday (Koch, 1977).

Researchers from a variety of perspectives as disparate as primatology (Harlow, Gluck, & Suomi, 1972; Reite, Seiler, & Short, 1978), psychoanalytic (Bowlby, 1960, 1969) and social learning theory (Seligman, 1975), and sociology (Bendiksen & Fulton, 1975; Werner & Smith, 1980), among others, have claimed that the experience of early parental death renders the individual more vulnerable to a multitude of serious and enduring pathological states.

The sequelae of parental death in childhood can be classified as immediate reactions, which occur during the initial weeks or months after the death; intermediate reactions, which may linger on for some years or occasionally emerge later in childhood or adolescence; and long-range effects, which may appear in adulthood, either seemingly

unprovoked or evoked by a subsequent loss or separation.

Immediate reactions of severe sleep, appetite, bowel and bladder habit disturbances (Raphael, 1983), phobic separation responses, impulsive and/or aggressive behaviors (Arthur & Kemme, 1964), hypochondria, withdrawal, dependency, and regression (Bloom -Feshbach & Bloom-Feshbach, 1987), and diminution in self-esteem (Kliman, 1980) have been reported. While some of these symptoms could be attributed to the mourning process and dissipated over time, others remained in evidence from one to six years after the parental death. Social isolation and learning problems (Elizur & Kaffman, 1982; Kaffman & Elizur, 1979), conflicts over independence (Arthur & Kemme, 1964), juvenile delinquency (Shoor & Speed, 1963; Gregory, 1965; Raphael, 1983) and frequent depression ranging from mild to severe (Van Eerdewegh, Bieri, Parilla, & Clayton, 1982) have been observed in both patient and community samples. Early parent loss has also been hypothesized as a contributing factor in the etiology of a number of medical conditions. Studies have shown a higher incidence of recent parent loss in children who develop juvenile rheumatoid arthritis (Herioch, Batson, & Baum, 1978) and juvenile diabetes (Leaverton, White, McCormick, Smith, & Sheikholislam,

1980 ; Stein & Charles, 1978).

In spite of the sizable literature cited above, the dearth of methodologically sound studies necessitates a cautious interpretation of the findings. The majority of the studies have relied on observations of children in psychotherapeutic treatment, a group that may not be representative of all bereaved youth (e.g., Arthur & Kemme, 1964). The studies that used random samples frequently did not include control groups, therefore offering no base rate information regarding problem behaviors among nonbereaved children (e.g., Kaffman & Elizur, 1983). In studies which did employ control groups, it is usually difficult to discern whether or not individuals were matched on important variables, such as age, gender, and socio-economic status (Raphael, 1982). Moreover, standardized instruments have rarely been used, and conclusions have often been based on clinical impressions gathered through informal assessment or parental reports without independent assessment of the child (Raphael, 1983).

Bowlby (1980) has theorized that early parental loss predisposes individuals to later emotional disturbances, since each subsequent loss will trigger an upsurge of unresolved grief related to

the original bereavement. The major thrust of investigations relating to long-term effects of premature parental death concerned various types of depression. Several investigators have shown a significantly higher rate of depressive disorders among individuals who had lost a parent in childhood or adolescence (e.g., Brown, 1961; Beck, Sethi, & Tuthill, 1963). Moreover, early loss has been correlated with the severity of depression; parental bereavement was associated with psychotic as opposed to neurotic depression in a majority of cases (Brown, Harris, & Copeland, 1977). Evidence regarding bereavement as an etiologic factor in the development of schizophrenia is less convincing than that of depression. Berg and Cohen (1959), Dennehy (1966), Watt & Nicholi (1979) have reported positive findings, whereas Granville-Grossman (1966) and Gregory (1958) found no significant correlations. Links between early parental death and alcoholism (Hilgard, 1963) and other substance abuse (e.g., Sholnick, 1979), as well as criminality (Brown & Epps, 1966; Markusen & Fulton, 1971) have been claimed. There has been some evidence of a relationship between premature parental death and impairment of adult sexual identity, development of autonomy, capacity for intimacy, loneliness, and problems in parenting (Archibald, Bell, Miller, &

Tuddenham, 1962; Brown, 1958; Lynch, 1977; Moriarty, 1967; Murphy, 1987; Remus-Araico, 1965). Seligman and his colleagues have suggested (1974) that those who experience early parental loss are more likely to present with general symptomology, increased health care utilization, and vague or specific complaints of ill health in adult life.

Despite all these assertions, no clear-cut evidence has emerged. Several investigators (Bloom-Feshbach & Bloom-Feshbach, 1987; Crook & Eliot, 1980; Gregory, 1958; Markusen & Fulton, 1971; Peris et al., 1985) have criticized the field, arguing that the results are suspect, since the vast majority of studies have been retrospective, some used unrepresentative or compared unlike samples, while others failed to differentiate among losses due to death, divorce or abandonment. This is not to say that critics have wished to dismiss childhood bereavement as a traumatic event that may influence adult functioning. Rather, they have questioned the conclusion that childhood bereavement inevitably results in adult pathology. They have proposed that there are many intervening variables that can influence the outcome of bereavement.

In response to these criticisms, researchers have attempted to

delineate the factors that can influence the severity and duration of symptoms. Generally, it has been agreed that the impact of parental loss may be greater at some developmental stages than at others (e.g., Alexander & Alderstein, 1958; Bowlby, 1980; Elizur & Kaffman, 1983). The time period preceding object constancy (Bowlby, 1980), as well as early adolescence (e.g., Van Eerdewegh et al., 1982) have been cited as the most vulnerable stages. The youngster's prior emotional instability as well as poor quality of the family environment before (Kaffman & Elizur, 1983), and nonsupportive relationship with the surviving parent subsequent to the loss (Brier, Kelsoe, Kirwin, Beller, Wolkowitz, & Picker, 1988) have been singled out as risk factors for pathological outcomes. On the other hand, a strong social support system (Finkelstein, 1988; Gray, 1987), minimal disruptions in living arrangements (Rutter, 1966), "appropriate" grieving by the surviving parent and his or her avoidance of excessive dependence on the bereaved child (Hilgard, Newman, & Fisk, 1960; Raphael, 1982), and the availability of parental substitutes (Hill, 1958; Werner & Smith, 1982) have been found to mitigate the impact of the loss and facilitate better adaptation. The circumstances of death (i.e., whether it was expected or unexpected, due to illness, homicide, suicide, or

accident) have also been shown to influence youngsters' reactions to parental death. Although each type of death is associated with a unique set of anxieties (Furman, 1974), it is generally believed that children, like adults, tolerate expected deaths more easily than sudden losses (Bloom-Feshbach & Bloom-Feshbach, 1987; Gray, 1987), with suicide and homicide being the most damaging forms of death (Pynoos, Gilmore, & Shapiro, 1983).

EARLY PARENTAL DEATH AND "DEATH OF MYSELF"

In the past, psychological research on early bereavement has concentrated mainly on the effects of stress, loss, desertion, and emotional and/or physical deprivation, and has focused attention on the pathogenic consequences of bereavement as it relates to the "death of others." Moreover, since much of the research utilized special samples, such as individuals who sought out or required professional help, these investigations have generally looked at extreme consequences. The conclusions derived from such samples may not apply to the many instances of premature parental death where professional interventions have neither been solicited nor needed. Moreover, the results of Denes and Ehrlichman's (in press)

study of a non-clinical sample of adults who experienced premature parental death suggests that the absence of pathology does not imply a lack of long-term consequences. The premature death of a parent has implications above and beyond the stress of separation, abandonment and loss; it also can have an impact on the concept of "death of myself" and play a role in the realization of personal mortality.

Based on clinical observations, some investigators have proposed that the death of a parent is more than simply the loss of a loved one, it also signifies the removal of a symbolic barrier between oneself and death (Jaques, 1968; Raphael, 1983). They have argued that the death of a parent is the phenomenon most often implicated in the change in the conceptualization of death from loss to a personal matter. This awareness of personal mortality in turn is "the central and crucial feature of the mid-life phase - the feature which precipitates the critical nature of the period" (Jaques, 1968 p. 506), producing a shift in temporal orientation, an increased awareness that personal time is limited. Neugarten and her associates, presenting the findings of an extensive longitudinal field study that utilized interview and projective test schedules, have arrived at similar conclusions

(Neugarten, 1968; 1973; Neugarten & Associates, 1964; Neugarten & Datan, 1973, 1974). They have found that the realization of personal mortality, similarly to other psychological transitions, is often determined not simply by an orderly and sequential maturation process but is influenced by individual life experiences. However, regardless of chronological age, the recognition of the finitude of time is typically followed by a restructuring of the individual's life in terms of time-left-to-live rather than time-since-birth, stock-taking, intensified introspection and the structuring and restructuring of values, priorities and life goals.

Therefore, it would appear that the consequences of premature parental death are neither necessarily pathological, nor restricted to pathology. The experience of premature parental death might accelerate the realization of personal mortality with all its accompanying features.

SUBJECTIVE LIFE EXPECTANCY

Subjective life expectancy (SLE) is a person's projection of his or her life span. Based on the existentialist proposition that "it is the timing of one's death that makes all the difference when it comes to

the meaning of one's life" (Kaufmann, 1959, p. 52), individuals' expectations of their own life spans, by determining their personal time perspective, can potentially influence, or alternatively, can be an indicator of their perspective on a number of aspects of their lives. In spite of its presumed importance, empirical research on SLE is scarce; a thorough search of the literature found only eight studies examining the construct, one by this author (Denes & Ehrlichman, in press; Handal, 1968; Kastenbaum & Brisco, 1980; Robbins, 1988; Robbins, 1989; Sabatini & Kastenbaum, 1973; Teahan & Kastenbaum, 1970; Tolor & Murphy, 1967).

These investigations have demonstrated that SLE is not simply a consequence of demographic factors. Although individuals did take reality-based data, such as lifestyle, risk taking behavior, and history of family longevity into consideration in predicting the duration of their lives, their SLEs were not the results of straightforward computations (Kastenbaum & Brisco, 1980; Robbins, 1989; Teahan & Kastenbaum, 1970). Attitudes toward death, anxiety, need for deference, affiliation, intraception, succorance, abasement, nurturance, change, achievement, autonomy, dominance, heterosexuality, and aggression correlated with life expectancy predictions (Handal, 1968; Tolor and

Murphy, 1967). Moreover, some authors have speculated that there are other presently unidentified variables which might enter the equations (Denes & Ehrlichman, 1990; Handal, 1968; Robbins, 1989; Tolor & Murphy, 1967). The inadequacy of purely objective factors to account for personal life span predictions has been demonstrated by several investigators (Handal, 1968; Robbins, 1989; Tolor & Murphy, 1967). These investigators have found that male subjects' SLEs significantly exceeded actuary data for the life expectancy for their cohort. Female subjects also had a tendency to overestimate their own life expectancy in relation to the actuary data, but the difference did not reach statistical significance (Robbins, 1989; Tolor & Murphy, 1967). In addition, Tolor and Murphy (1967) demonstrated that these results were not the artifacts of the subjects' misconceptions of the normative life span of their cohort; their life expectancy projection for similar others were generally consistent with actuary data. Therefore, these investigators have proposed that SLE most likely reflects interactions among several factors.

Denes and Ehrlichman (in press), have shown that SLE is composed of different objective (rational) and subjective (experiential) factors. They found that instructions emphasizing "objective facts" or

"personal feelings" produced vastly divergent predictions of personal life span from the same person. When individuals were asked to make the judgement about their life span based on "everything that is objectively true" about them they projected equivalent life spans for themselves and for other people of the same age, sex, race, and socio-economic status. However, when the instructions called for projections based on "personal feelings" individuals anticipated significantly longer or significantly shorter life-spans for themselves than for others, the direction being strongly influenced by their bereavement status, as will be described later.

UNREALISTIC OPTIMISM

The research findings demonstrating unrealistically high projections for individuals' own life expectancy vis-a-vis comparable others or actuary data concur with the findings of many studies that have documented that people tend to demonstrate "unrealistic optimism" about their future health and well-being (e.g., Harris & Guten, 1979; Weinstein, 1980, 1982) and maintain an "illusion of unique invulnerability" (Perloff, 1983; Perloff & Fetzer, 1986). That is, individuals believe that their own chances of experiencing an

undesirable event are much lower than those of comparable others. This systematically-biased risk perception has been shown for general health (Larwood, 1978), specific illnesses (Harris & Guten, 1979; Perloff, 1983; Weinstein, 1980, 1982), social ailments, such as divorce or unemployment (Perloff & Farbisz, 1985; Weinstein, 1980), and accidents and victimization (Perloff & Fetzer, 1986; Weinstein, 1980). Previous personal encounters with an undesirable event may eliminate or reverse the bias (Weinstein, 1980); However, such shifts limited to the particular event and situation and normally do not generalize to other risks (Weinstein, 1989). For example, the effects of similar events or indirect experience, such as observing neighbors', friends' or family members' encounters with undesirable events, on the perception of personal vulnerability are quite small (Tyler, 1980).

Weinstein (1982) has proposed that both cognitive heuristics (such as availability) and motivational or ego-defensive factors (such as self-esteem maintenance) contribute to these errors in judgment. One of the major ego-defensive factors responsible for such errors is the tendency to overestimate one's capability of avoiding risks for events that are perceived as controllable. Further, as Martin, Abramson, and Alloy (1984) have demonstrated that people

overestimate personal control over uncontrollable events, this ego-defensive strategy can account for the widespread existence of "unrealistic optimism". The perception of exaggerated control has been proposed to have an adaptive or evolutionary significance through engendering hope, and motivating the individual to persist to obtain the desirable outcome (Abramson & Alloy, 1981; Taylor & Brown, 1988). On the other hand, feelings of vulnerability or susceptibility to threat can to elicit fatalism, magical thinking, and helplessness (McCrae, 1984; Rippetoe & Rogers, 1987). Rippetoe and Rogers (1987) found that the greater individuals' feelings of vulnerability or susceptibility to the threat was, the stronger they believed that there was no way to avoid the danger, and the less motivated they were to engage in preventive health behaviors. While biases in perceived vulnerability have most often been examined in relation to the individual's failure to engage in self-protective behavior, the lack of these biases also has the potential to produce maladaptive behavior (Taylor & Brown, 1988).

EARLY PARENTAL DEATH, SUBJECTIVE LIFE EXPECTANCY, AND PERCEIVED VULNERABILITY

On the basis of clinical observations, Kastenbaum and Aisenberg (1976) and Osterweis (1984) have claimed that individuals whose parent(s) died prematurely of a disease which is perceived by them as requiring a genetic predisposition did not expect to live as long as other people and often anticipated being struck down by the same disease as their parents. In order to explore this clinical claim empirically, Denes and Ehrlichman (1991) examined SLE in a non-clinical sample of individuals who had lost a parent to natural causes in childhood or adolescence. They found that those individuals who believed that they would die of the same disease as their parents predicted a shorter life span for themselves than for others in their cohort. This pattern was evident in both "objective" judgments and "personal feelings." In addition, these individuals anticipated a significantly shorter life span than did matched individuals whose parents were alive. Bereaved subjects who did not believe that their own deaths would be related in any way to their parents' deaths did not differ significantly in SLE from the non-bereaved subjects when the instructions called for an assessment based on "objective facts".

However, when affective reactions were requested, the pattern which emerged was identical to (although not as extreme as) the pattern exhibited by individuals who believed that they would die of the same cause as their parents, and the opposite of control subjects. Bereaved subjects, regardless of their belief about the cause of their own death, estimated a substantially shorter life span for themselves when the basis of their projections was "personal feelings" than when it was "objective facts"; further, their SLEs were significantly lower than either those of non-bereaved individuals, or their projections for comparable others. In contrast, non-bereaved individuals' own life expectancy projections increased significantly when based on "personal feelings" as opposed to "objective facts". It is important to point out that bereaved and control subjects had virtually identical projections of life expectancy for others. Differences in personal SLE did not reflect differences in conceptions of the normative life span, but rather a contrast in perceived personal vulnerability.

As mentioned earlier, the loss of "unrealistic optimism" appears to be elicited only by personal experience with the particular undesirable event (Weinstein, 1980, 1982). Naturally, no one can have previous personal experience with one's own death; however,

the findings of Denes and Ehrlichman (in press) suggest that the premature death of a parent has a direct effect on the individual's perception of his or her own risk relating to life expectancy. These findings seem to corroborate the philosophical (Koestenbaum, 1971) and clinical (Jaques, 1965; Neugarten, 1968; Raphael, 1983) assertions that while the death of a parent is clearly the "death of another," by the virtue of its closeness to the self, it can also activate feelings about the "death of myself" and awaken the reality of personal death. Although, this interpretation is consistent with the above mentioned authors' assertions, there is also an alternative explanation. As the parents of these subjects died of illnesses which are commonly believed to have a genetic component, the possibility that the patterns observed reflect the individuals feelings of genetic vulnerability to these illnesses can not be ignored.

EARLY PARENTAL DEATH AND HEALTH BEHAVIOR

Denes and Ehrlichman (in press) also asked subjects about their health behaviors. Bereaved individuals who professed a belief that they would die of the same cause as their deceased parents reported poorer health behavior than either individuals who lost a parent but

did not believe that their own death would be related in any way to their parents' death, or those whose parents were alive. These individuals were characterized by heavy cigarette smoking and carelessness in dietary patterns significantly more often than individuals in the other two groups. Bereaved individuals who believed that the way their parents died would not influence their own deaths reported health practices comparable to those of the control subjects. These results are not surprising in light of Rippetoe and Rogers' (1987) finding that high levels of perceived threat can produce maladaptive coping strategies, such as hopelessness or fatalistic attitudes, which in turn lead to dysfunctional behavior. It is an important issue because family history of disease strongly interacts with health related behavior in predicting longevity (e.g., Belloc & Breslow, 1972; Breslow & Enstrom, 1980; Jenkins, 1988). Cigarette smoking and poor eating habits have been characterized as the primary behavioral contributors to both cardiovascular diseases and cancer (e.g., Kannel, 1983), the two most common causes of premature parental death for the participants in Denes and Ehrlichman's study. Therefore, the poor health habits of these individuals could be considered a risk factor for early death, possibly

serving as a self-fulfilling prophecy.

PURPOSE OF THE RESEARCH

The purpose of the present research was fourfold. Three aims were addressed in Study 1: (1) an attempt to replicate the results of our previous investigation; (2) an effort to clarify one of the key findings of that study; and (3) an examination of whether or not the lack of unrealistic optimism regarding subjective life expectancy showed by subjects who lost a parent prematurely will also be present when estimating risks for health hazards. The forth aim, addressed in Study 2, was to explore whether those findings are restricted to the population of the previous study (i.e., people whose parents died prematurely) or would also generalize to the a new population (people whose parents are alive but suffered an illness at a relatively young age that was perceived by the subjects as potentially life-threatening*).

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*This investigation is concerned with subjects' perceptions of particular illnesses, their personal vulnerability to those illnesses, and their behaviors influenced by those perceptions. Therefore, whether or not the particular illness is life-threatening according to medical definitions is irrelevant to our purposes.

Study 1

Study 1 was primarily designed to replicate the earlier findings of Denes & Ehrlichman (in press), and to establish more conclusively the links among premature parental death due to illnesses, reduced SLE, and poor health behavior. Furthermore, because SLE, as well as health behavior, differed significantly among those who experienced premature parental death depending on whether or not they felt vulnerable to the cause of their parents' death, Study 1 also sought to delineate some of the factors which might be responsible for differential appraisal of personal susceptibility to the parental cause of death.

The following hypotheses were examined:

1. There will be no significant difference in the conception of normative life span between subjects whose parents died prematurely (parents deceased or PD group) and comparable others whose parents are alive and perceived as basically healthy by the subjects (parents healthy or PH_1 group).

2. Subjects in the PD group will have a shorter subjective life expectancy, both on the rational and the experiential levels, than PH_1 subjects.

3. Subjects in the PD group will predict a shorter life span for themselves, both on the rational and the experiential levels, than they will for comparable others.

4. Subjects in the PH_1 group will predict a longer life span for themselves on the experiential level than they will for comparable others.

5. Subjects in the PD group will predict a shorter life span for themselves on the experiential than on the rational level.

6. Subjects in the PH_1 group will predict a longer life span for themselves on the experiential than on the rational level.

7. PD subjects will report worse health behavior than will PH_1 subjects.

8. Subjects in the PD group will show less unrealistic optimism making comparative risk judgments involving health problems than PH_1 subjects.

9. PD subjects who believe that they will die of the same cause as their parents did will exhibit all the characteristics hypothesized for the PD group, but in exaggerated form.

The predicted outcome of Hypothesis 9, namely that subjects' beliefs concerning the relationship between their parents' and their

own cause of death will influence their SLE and/or health behavior, was the starting point for the second aim of the study: identification of some of factors that are responsible for subjects' differential appraisal of their vulnerability to the cause of their parent's death. The variables that may influence subjects' perceptions of whether or not they will die of the same causes as their parents include: (1) the child's age at the time of the parent's death; (2) the particular illness the parent died of, more specifically its perceived genetic heritability; (3) and the gender of the deceased parent and of the bereaved child. These are explained in more detail next.

Exploratory hypothesis 1: The child's age may be important since a mature concept of death, which includes finality and inevitability, typically does not appear until the ages of ten to twelve (Nagy, 1948). Therefore, the experience of parental death before that age may have a different impact on the child.

Exploratory hypothesis 2: Common illnesses have a range of meanings in society. Different illnesses have different meaning systems attached to them, regarding inevitability versus personal responsibility in developing as well as controlling them. Therefore, the particular illness the parent died of may have an influence on the

child's perception of his or her future.

Exploratory hypothesis 3: The gender match between child and deceased parent also could be an important factor, as some illnesses are clearly gender specific (e.g., prostate or uterine), others are more likely to develop in members of one gender than the other (e.g., heart disease), while others again seem to have no gender preference (e.g., stomach cancer).

Since these hypotheses are based on theoretical assumptions which are relevant to the present investigation only by conjecture, there is little justification for making directional predictions.

Study 2

Study 2, which is more exploratory in nature, examines whether the death of a parent is necessary to produce the phenomena described earlier or whether having a parent who has prematurely developed an illness which is perceived by the subject as life-threatening and involving a genetic component will similarly influence SLE and/or health behavior. The clarification of this issue is essential both on theoretical and practical grounds.

Theoretically, it is important to understand whether or not

death makes a unique contribution to the patterns observed. Numerous claims have been made about the influence of premature parental death on individuals' awareness of their own mortality and its potential impact on the structuring of their lives (Jaques, 1965; Kastenbaum & Aisenberg, 1976; Neugarten, 1968; Osterweis, 1984). However, these studies do not untangle whether the lack of "unrealistic optimism" concerning SLE is a reflection of an acute awareness of personal mortality or simply a reflection of the individuals' beliefs in their own genetic risk.

On a practical level, it is important to know if individuals whose parents developed an illness early in life which the subjects perceive as life-threatening do feel vulnerable to the particular illness and consequently, like those whose parents died prematurely, may also be at risk for poor health behavior. For example, the risk of developing cardiovascular disease and cancer, which account for roughly two thirds of all deaths in this country (Bureau of the Census, 1987), can be greatly reduced by preventive health behaviors, such as refraining from smoking, maintaining good dietary habits and exercising. Thus, appropriate health interventions for such at-risk individuals could be designed.

METHOD

Base Sample

Data were collected from 2125 undergraduate students in 19 colleges and universities in the New York Metropolitan Region. (For the demographic breakdown of the sample see Appendix A.) Students were enrolled in various social science courses, volunteered to participate and received no payment.

Study 1

Matched Samples

The sample population for the present study was more specifically defined and rigorously selected than is usual in studies of bereavement. Selection of the bereaved population was determined by the relationship of the deceased to the subject, the type of death, and the age of the deceased as well as of the subject at the time of the death. In the base sample, 172 subjects had lost one or both of their parents due to illness before the parent reached the age of 55. (This age was selected to define premature death as it approximately corresponds to a 20-year reduction from the normative life span of

that cohort, U.S. Bureau of Census, 1988.) Data from five of these subjects were excluded from the analysis, two who already had lived longer than their deceased parent, one who failed to follow instructions, and one who could not be matched with a control subject. The remaining 167 subjects who fit the above mentioned criteria comprised the "parent deceased " or PD group. The subjects' age at the time of parental death ranged from less then a year to 18 years (mean age was 14.73 years). The parents' age at the time of their death ranged from 28 to 55 years, the mean age being 45 years. Approximately 43 percent of the subjects lost their same sex parent and 57 percent lost the opposite sex parent. The use of carefully matched control group also distinguished this study from the majority of bereavement-related research projects. In order to reduce possible extraneous sources of variance, and to produce groups of equal numbers, subjects in the PD group were individually matched on age, gender, ethnicity, religion and school affiliation with subjects whose parents were alive and did not have an illness that the subject perceived as life-threatening. (For the exact matching procedure see Appendix B.) The latter group is called the "parent healthy" or PH_1 group. All statistical analyses were carried out using the 167

matched pairs.

Procedure

Instructors of social science classes were approached, informed about the purpose of the study, and questioned whether or not they felt their students would benefit from participating in the research and whether they were willing to provide class time. In the case of an affirmative answer, time was arranged for the administration of the questionnaire. The investigator explained that the purpose of the study was to learn about the ways different people view certain important health related issues, including serious illnesses that they perceive as potentially life-threatening. The voluntary and confidential nature of participation was strongly emphasized. Students were advised that they could stop participating at any point during the session, and they were not required to turn in the completed forms. At the conclusion of the session the investigator provided a detailed description of the research, described previous findings, and answered the subjects' questions.

Measures

The questionnaire consisted of four separate sections. The first section inquired about SLE, predicted cause of death, predicted age at

the time of the first serious illness, and what that illness will be. The second section measured unrealistic optimism concerning various diseases. The third section solicited self-reports of health behaviors such as smoking, drinking, exercise, and dietary habits. The fourth section collected information about the subjects' background in general and about their families' medical history in particular. A copy of the questionnaire can be found in Appendix C.

Section I: Subjective Life Expectancy, Predicted Cause of Death, Predicted Age at the Time the First Serious Illness, and the Name of Illness.

Participants were asked to make projections for themselves and other people of the same age, sex, race, and socioeconomic status about life expectancy and the age when they will develop the first serious (potentially life-threatening) illness, to name the illness they think they will develop at that time, and what they think will be their cause of death. Questions relating to the subjects themselves asked for predictions based on "objective" knowledge (rational) as well as on their "gut feeling" (experiential).

Section II: Comparative Risk.

A subset of items from Weinstein's (1980) unrealistic optimism

measure were used to assess individuals' perception of their own risk as compared to others of their own age and sex. This measure does not have to be administered in its entirety; Weinstein (1980, 1982, 1983, 1987), as well as other investigators (Kulik & Mahler, 1987; Perloff, 1982; Perloff & Fetzer, 1986) have used subsets of the original items to suit the particular research question. Moreover, subjects' unrealistic optimism in these studies was not defined by a global summary score but measured separately for each health problem, and normative data are available for individual items. In this study items were chosen which represented the major illnesses listed as the cause of parental death in our earlier study (Denes & Ehrlichman, in press). These included diabetes, high blood pressure, heart attack, stroke, and several forms of cancer, all of which have been shown previously to produce optimistic biases in college student (Kulik & Mahler, 1987; Perloff, 1982; Perloff & Fetzer, 1986; Weinstein, 1980, 1982) and community samples (Weinstein, 1987). Items were worded as follows: "Compared to other people of my age, sex, race, and socioeconomic status, my chances of getting (name of the problem) in the future are: much below average, below average, little below average, average, little above average, above average,

much above average, I already have the illness." In analyzing the comparative risk judgments, the first seven possible responses were assigned numerical values ranging from -3 to +3. Individuals who already suffered from any of the problems on the list or stated that they suffered from a life-threatening illness were not included in the study.

Section III: Preventive Health Behavior.

Health practices that have been shown by epidemiologists to influence life expectancy, such as smoking, drinking, exercise, and dietary habits were central to this measure (Breslow & Enstrom, 1980). For each health practice, subjects were asked to indicate their behavior on a 6-point Likert scale, where (after reversing the scores of particular items) 1 signified good health practices and 6 signified poor health practices. As health behaviors are not necessarily interrelated, each item was treated as an independent act that impacts on the individual's health.

Section IV: Background Information.

The last section of the questionnaire solicited demographic and health status information about the respondents and their parents. This section was designed to distinguish between those subjects

whose parent(s) died prematurely, and those whose parents were alive and perceived by the subjects as basically healthy. It also established the nature of parental illness, the age of the parent and the subject at onset of parental illness, and the year of death. Several filler items were included to provide face validity to the stated purpose of the study: people's views of health-related issues.

Method of analysis

The data analysis was designed to replicate the findings obtained by Denes and Ehrlichman (in press) regarding lower SLE and poorer health behavior (HB) for subjects whose parents died prematurely than comparable others whose parents were alive and perceived as basically healthy by the subject.

Hypothesis 1: To ascertain that differences regarding subjective life expectancy do not reflect differences in conceptions of the normative life span between the PD and PH_1 subjects, a test of mean differences (matched pairs t-test) was performed regarding projected life expectancy for others (PLE/O).

Hypothesis 2: Matched pairs t-tests were computed to examine group differences between PD and PH_1 subjects concerning rational subjective life expectancy (SLE/R) and experiential subjective

life expectancy (SLE/E).

Hypotheses 3 and 4: Correlated t-tests were computed to examine within- group mean differences regarding rational subjective life expectancy (SLE/R) and projected life expectancy for others (PLE/O) as well as experiential subjective life expectancy (SLE/E) and projected life expectancy for others (PLE/O). These analyses were computed separately for the PD and the PH_1 groups.

Hypotheses 5 and 6: Correlated t-tests were computed to examine within-group mean differences regarding rational subjective life expectancy (SLE/R) and experiential subjective life expectancy (SLE/E). These analyses were also computed separately for the PD and the PH_1 groups.

Hypothesis 7: Matched pairs t-tests were computed to examine group differences between PD and PH_1 subjects on the five health behaviors separately.

Hypothesis 8: Matched pairs t-tests were computed to examine group differences between PD and PH_1 subjects for each of the seven comparative risk judgments.

Hypothesis 9: PD subjects were divided into two groups by matching their predictions about the cause of their own death with

their reports of the cause of their parents' death. These divisions were made according to both the rational and the experiential predictions of the subjects. Those subjects who believed that they would die of the same cause as their parents formed the "parent deceased rational/experiential same cause" (PD/RSC and PD/ESC) subgroup, while those subjects whose prediction for the cause of their own death was different from the cause of their parents' death, formed the "parental death rational /experiential no relationship" (PD/RNR and PD/ENR) subgroups. There was a 76 % overlap between the "parents deceased rational same cause" and "parents deceased experiential same cause" groups. Analyses one through eight were repeated. Group comparisons were computed between the appropriate subgroups (PD/RSC versus PD/RNR and PD/ESC versus PD/ENR), regarding rational as well as experiential subjective life expectancy, the five health behaviors and the seven comparative risk judgments.

Study 2

Sample Selection

Among the 2125 participants 230 were identified as having a parent currently alive who had developed an illness early in life (before

the age of 55) which the subject perceived as life-threatening. Data from 27 subjects were excluded from the analysis, 17 who failed to follow instructions and 9 who could not be matched with control subjects. The remaining 204 subjects formed the "Parents Ill" or PI group. Similarly to Study 1, in order to reduce possible extraneous sources of variance and to produce groups of equal numbers, subjects in the PI group were individually matched on age, gender, ethnicity, religion and school affiliation with subjects whose parents were alive and do not have an illness that the subject perceives as life-threatening. This group was called the "Parent Healthy" or PH_2 group. In order to provide independent samples in Study 1 and Study 2 subjects who were in the PH_1 group in Study 1 were excluded from the selection process in Study 2. All statistical analyses were carried out using the matched pairs.

Procedure and Measures

The procedures used and the measures used in Study 2 were identical to those described in Study 1.

Method of analysis

As the purpose of this study was to examine whether subjective life expectancy, health behavior, and comparative risk

judgments patterns of individuals whose parents prematurely developed an illness which was perceived by the subjects as life-threatening would parallel the patterns observed among individuals who experienced premature parental death, or the findings obtained from the latter group reflect a unique impact of death, all analyses carried out in Study 1 were repeated here. However, predicted illness measures were added to the life expectancy measures.

3. RESULTS

Study 1.

Subjective Life Expectancy

The results for subjective life expectancy are shown in Table 1 and graphed in Figure 1. Contrary to the prediction in Hypothesis 1, PD and PH_1 differed in their conception of normative life span; PD subjects' projections of life expectancy for others were significantly higher than that of PH_1 subjects. All other hypotheses regarding subjective life expectancy (Hypotheses 2-6) were supported. Subjects who lost a parent prematurely predicted significantly lower life expectancies for themselves than did control subjects, both with a "rational" *mind set* (Rational Subjective Life Expectancy) when they made their "best guess" based on "everything that is objectively true" about them, and with an "experiential" set (Experiential Subjective Life Expectancy) when they indicated their "gut feelings". In order to adjust for the differential perceptions of normative life span, difference scores were calculated for each subject between Projected Life Expectancy for Others and SLE/R (Adjusted Rational Subjective Life Expectancy or SLE/R/A), as well as Projected Life Expectancy for

Others and Experiential Subjective Life Expectancy (Adjusted Experiential Subjective Life Expectancy or SLE/E/A). When analyses were conducted using the difference scores, group differences were magnified on both the rational t (166) = 13.83, $p < .001$ and the experiential levels t (166) = 20.03, $p < .001$.

Within the PD group, both Rational Subjective Life Expectancy $t(166) = -10.41$, $p < .001$ and Experiential Subjective Life Expectancy $t(166) = -17.13$, $p < .001$ were significantly lower than Projected Life Expectancy for Others. On the other hand, PH_1 subjects predicted a longer life span for themselves, both on the rational t (166) = 11.31, $p < .001$ and the experiential (t 166) = 13.33, $p < .001$ levels, than they did for comparable others. In both groups, subjects' Rational Subjective Life Expectancy and Experiential Subjective Life Expectancy differed significantly from each other. In the PD group, individuals' projection of their life span, when based on "everything that is objectively true" about them, was significantly higher than their "gut feelings" about it $t(166) = 8.33$, $p < .001$. In the PH_1 group the opposite relationship was observed between these two variables $t(166) = -2.06$, $p < .041$.

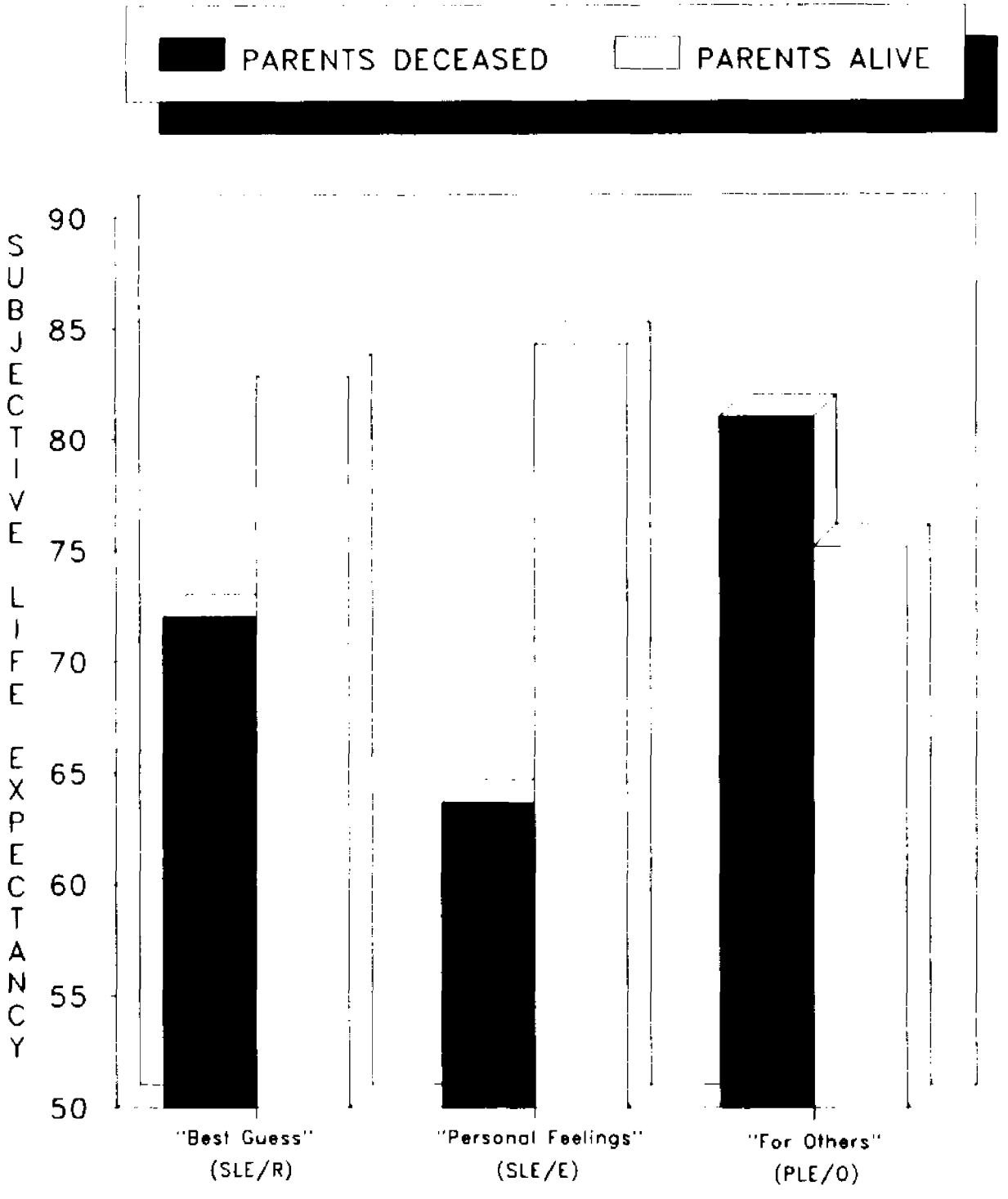
Table 1

Subjective Life Expectancy for PD and PH_1 Groups

	Parents Deceased PD		Parents Healthy PH_1			
	M	SD	M	SD	t	p
Rational Subjective Life Expectancy	72.00	11.97	82.84	8.55	-9.94	.001
Experiential Subjective Life Expectancy	63.65	15.29	84.30	8.85	-14.7	.001
Projected Life Expectancy for Others	81.00	10.61	75.13	8.95	5.48	.001

Note. N in both groups = 167.

FIGURE 1


PARENTS DECEASED
PARENTS ALIVE
SUBJECTIVE LIFE EXPECTANCY
90
85
80
75
70
65
60
55
50
"Best Guess"
(SLE/R)
"Personal Feelings"
(SLE/E)
"For Others"
(PLE/O)

Health Behavior

Three of the five self-reported health behaviors differed significantly between the PD and PH_1 groups. Subjects in the PD group reported that they exercise less, smoke more, and monitor their calorie intake less carefully than matched control subjects. Thus, hypothesis 7 was supported. Mean scores for self-reported health-behavior are illustrated in Table 2 and in Figure 2.

Unrealistic Optimism

The results for unrealistic optimism are shown in Table 3. Inspection of the means indicates that although the degree of unrealistic optimism differed by event, participants as a whole and PH_1 subjects in particular tended to believe that their own risk for various health problems was less than average. All participants showed significant unrealistic optimism on 6 of the 7 events. The only exception occurred for cancer: subjects in the PD group reported that they believed themselves to have a slightly greater chance of developing cancer than comparable others.

The real question of interest, however, is whether comparative risk judgements of subjects whose parents died prematurely and those whose parents are alive and healthy differ systematically. Matched pairs t-tests showed significant differences between PD and PH_1 groups for diabetes,

lung cancer, cancer in general, heart attack, and stroke. Thus, hypothesis 8 was supported.

Table 2

Self-Reported Health Behavior for PD and PH_2 Groups

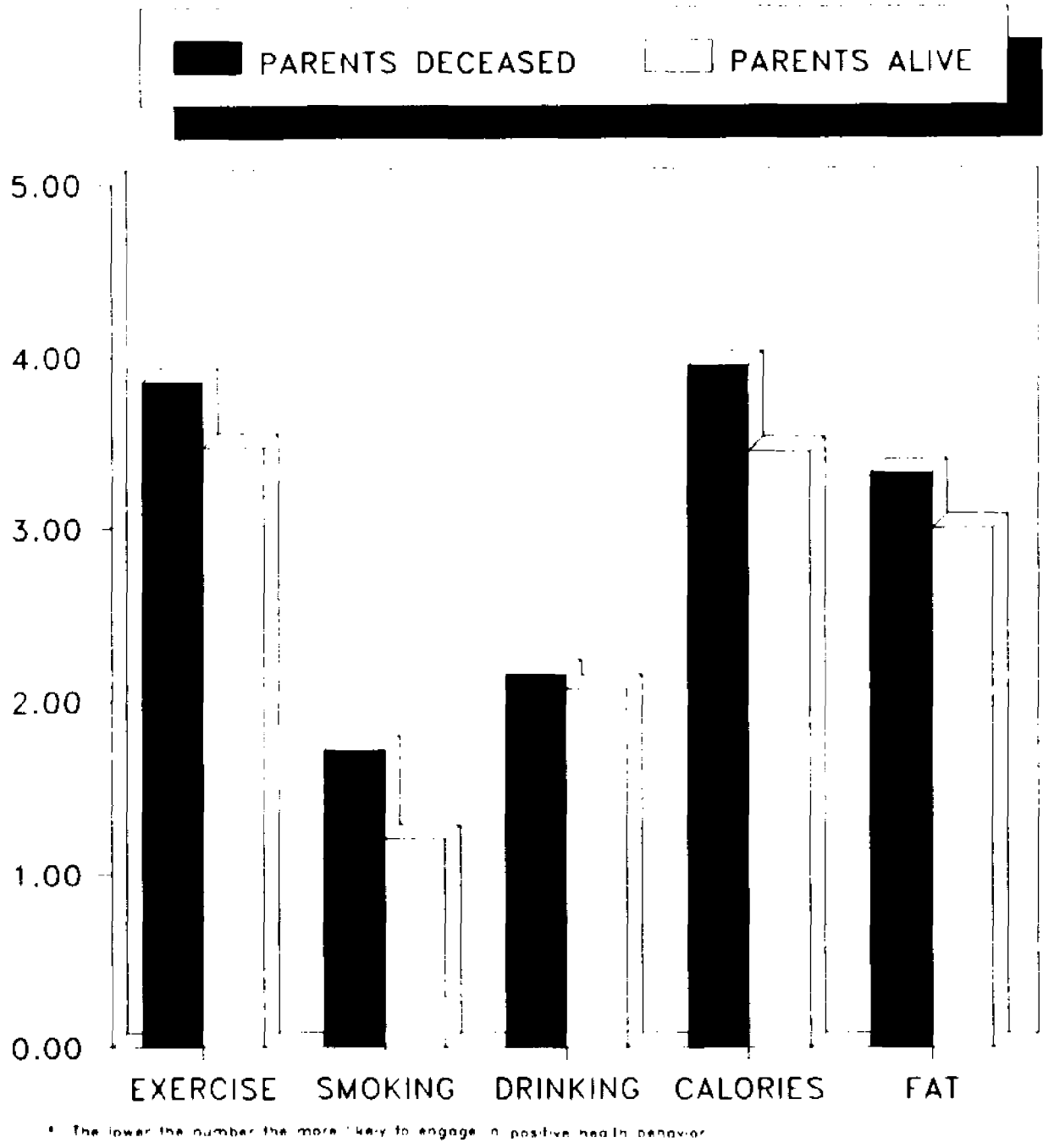
	Parents Deceased PD		Parents Healthy PH_1			
	M	SD	M	SD	t	p
Exercise	3.86	1.66	3.45	1.45	2.40	.108
Smoking	1.72	1.39	1.20	.59	4.87	.001
Drinking	2.15	.95	2.05	1.00	1.13	ns
Calories	3.95	1.68	3.40	1.82	2.90	.004
Fat	3.30	1.68	3.00	1.55	1.86	ns

Note. N in both groups = 166.

Lower numbers indicate more positive health behavior.

FIGURE 2

HEALTH BEHAVIOR



* The lower the number the more likely to engage in positive health behavior

Table 3

Comparative Risk Judgements concerning Health problems for PD and PH_1 Groups

	Parents Deceased PD		Parents Healthy PH_1			
	M	SD	M	SD	t	p
Diabetes	-0.80	1.87	-1.19	1.72	1.99	.049
High blood pressure	-0.36	1.80	-0.59	1.66	1.16	ns
Lung cancer	-0.86	1.88	-1.45	1.80	2.80	.006
Breast cancer	-0.77	1.80	-.096	1.64	1.19	ns
Cancer in general	0.16	1.68	-0.49	1.46	3.74	.001
Heart attack	-0.23	1.71	-0.69	1.53	2.66	.009
Stroke	-0.61	1.50	0.93	1.50	2.06	.041

Note. N in both groups = 163.

A negative value indicates unrealistic optimism, since it denotes a tendency to claim that one's own risk is less than comparable others.

Comparisons within the PD group

To test Hypothesis 9, which predicted that PD subjects who believed that they would die of the same cause as their parents would exhibit the beliefs and behaviors found in the PD group in a more exaggerated form, the PD group was divided into two subgroups. This division was accomplished by matching subjects' response concerning the likely cause of their death on the rational level (question 4) with the cause of their parents' death. Subjects who believed they would die of the same cause as their parent(s) (n = 70) constituted the DYSAME/R subgroup. Subjects who mentioned a different illness as their likely cause of death than the one the parent(s) died of (n = 92) constituted the DYDIFF/R subgroup. Contrary to our predictions no difference were found between the two groups on any of the life expectancy or health behavior measures (all ts less than 1.5). The procedure was repeated using the predictions concerning the likely cause of the subjects' death reported on the experiential level. Similar to our findings on the rational level, the DYSAME/E (n = 62) and the DYDIFF/E groups (n = 97) showed no difference regarding subjective life expectancy or health behavior (all ts less than 1).

Analyses showed no significant associations between subjective life expectancy and the age of the subject at the time of parental death, the

particular illness the parent died of or the gender-match between subject and the deceased parent (Exploratory Hypotheses 1-3).

Study 2

This study was designed to examine whether having a parent who prematurely developed an illness perceived by subjects as life-threatening would influence their projections of the age when they will develop a series illness, their subjective life expectancy and their health behavior. Subjects whose parents had developed a life-threatening illness before the age of 55, but whose parents were both alive at the time of the investigation comprised the "parent ill" or PI group. As in Study 1, PI subjects were individually matched with subjects from the base sample whose parents were alive, did not have a series illness, and were not part of the comparison group in Study 1. The comparison group in this study is referred to as "parent healthy" or PH_2 group.

Projected Age of Illness Onset

The results for Projected Age of Illness Onset are shown in Table 4 and graphed in Figure 3. PI subjects predicted that comparable others would develop a serious illness at a significantly younger age than did control subjects, t (190) = -.2.35, p = .02. However, PI subjects

projections for the age when they themselves might develop a serious illness did not differ significantly on the rational or the experiential levels from those of control subjects. PI subjects predicted that they will develop a serious illness at a significantly older age than will comparable others. These results were found both when the prediction was made on the rational, $t(199) = 4.57$, $p < .001$ and the experiential levels, $t(199) = 3.93$, $p < .001$. A similar pattern was observed for PH_2 subjects. Subjects' rational and experiential projections when they will develop a life-threatening illness did not differ significantly from each other in either group.

Subjective Life Expectancy

The results for subjective life expectancy are shown in Table 5 and illustrated in Figure 4. Subjects whose parent had developed an illness early in life that the subject perceived as life-threatening predicted significantly lower life expectancies for themselves than did control subjects, both with a "rational" mind set (Rational Subjective Life Expectancy) when they made their "best guess" based on "everything that is objectively true" about them, and with an "experiential" mind set (Experiential Subjective Life Expectancy) when they indicated their "gut feelings". The groups did not differ significantly in Projected Life Expectancy for Others.

Within the PI group, Rational Subjective Life Expectancy was

significantly higher than subjects' life span projections for others $t(202) = 3.97$, $p < .001$. However, Experiential Subjective Life Expectancy did not differ from Projected Life Expectancy for Others. On the other hand, PH_2 subjects predicted a longer life span for themselves, both on the rational, $t\ (202) = 8.24$, $p < .001$ and experiential, $t\ (202) = 8.79$, $p < .001$ levels, than they predicted for comparable others. In both the PI and PH_2 groups, subjects' Rational Subjective Life Expectancy and Experiential Subjective Life Expectancy differed from each other. In the PI group, individuals' projection of their life span when based on "everything that is objectively true" about them was significantly higher than their "gut feelings" about it, $t(202) = 3.03$, $p = .003$. In the PH_2 group the opposite relationship was observed between these two variables; however, it did not reach statistical significance. This relationship, along with the results for Projected Life Expectancy for Others, are displayed in Figure 4.

Table 4

Projected Age of Illness Onset for PI and PH_2 Groups

	Parents Ill PI		Parents Healthy PH_2			
	M	SD	M	SD	t	p
Rational Projected Age of Illness Onset	62.51	17.51	65.29	15.65	-1.55	.ns
Experiential Projected Age of Illness Onset	61.98	18.34	65.31	17.38	-1.75	.ns
Projected Age of Illness Onset for Others	56.70	13.29	59.78	13.57	-2.35	.02

Note. N in both groups = 191.

FIGURE 3

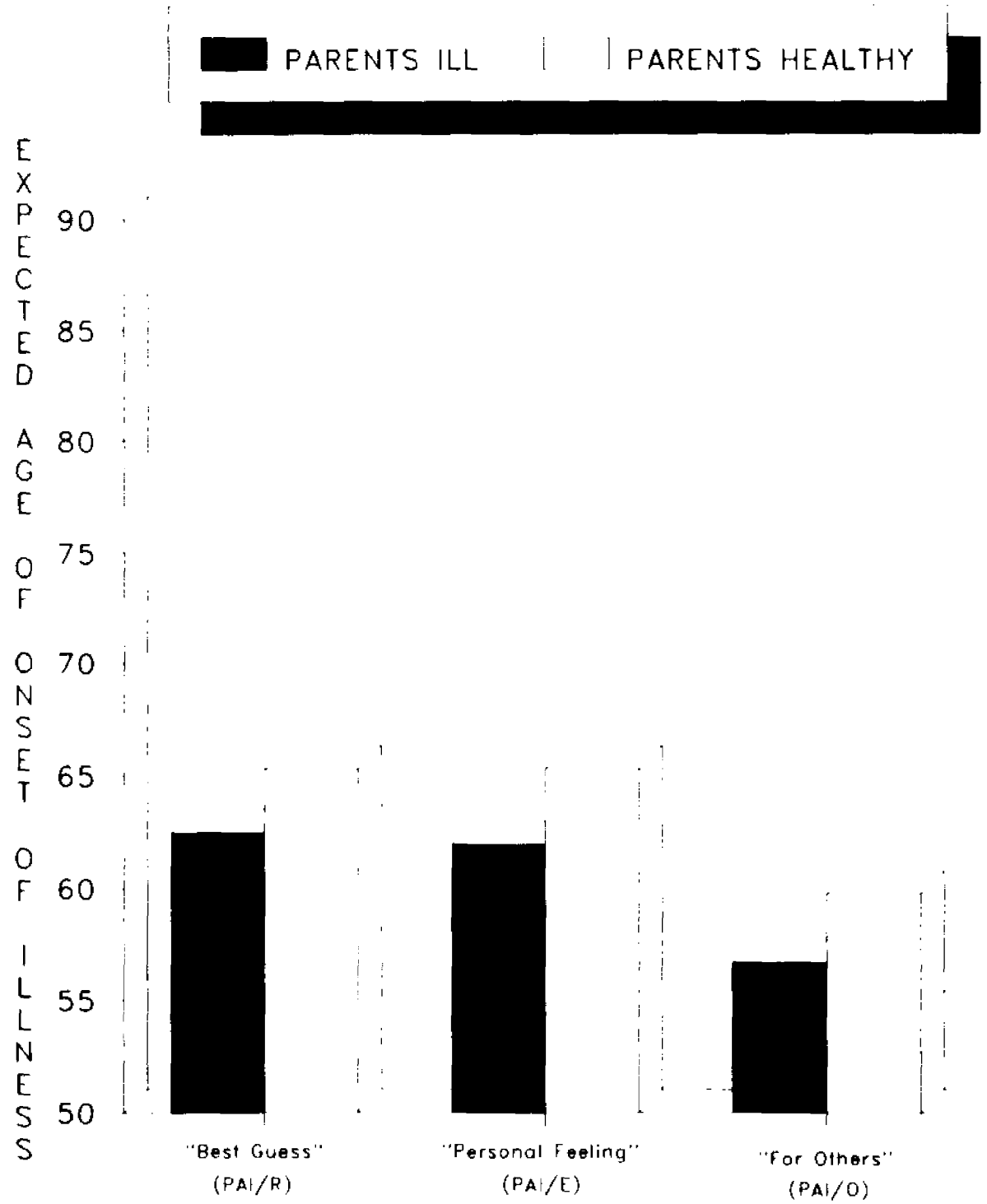

PARENTS ILL
PARENTS HEALTHY
EXPECTED AGE OF ONSET OF ILLNESS
90
85
80
75
70
65
60
55
50
"Best Guess"
(PAI/R)
"Personal Feeling"
(PAI/E)
"For Others"
(PAI/O)

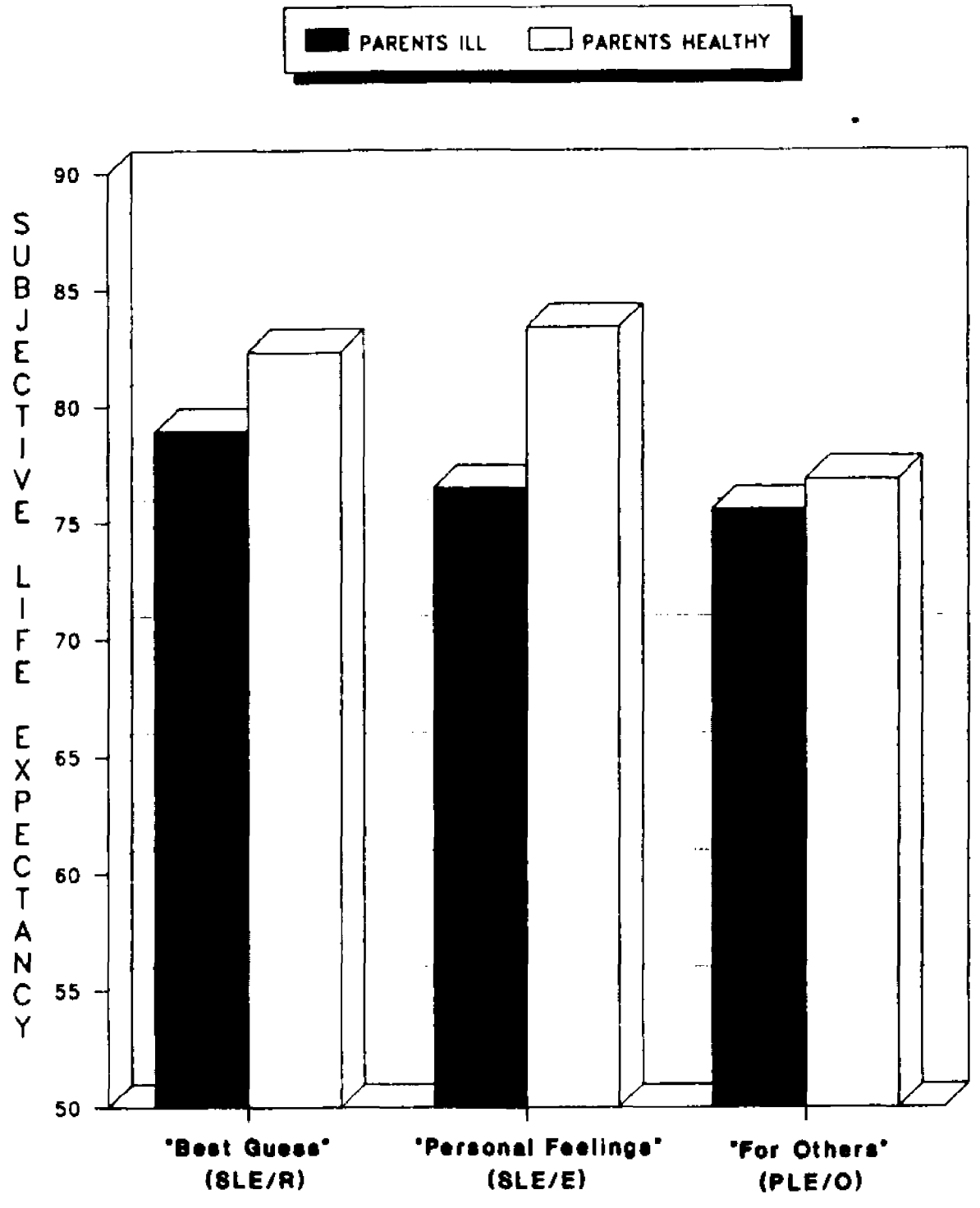
Table 5

Subjective Life Expectancy for PI and PH_2 Groups

	Parents Ill PI		Parents Healthy PH_2			
	M	SD	M	SD	t	p
Rational Subjective Life Expectancy	78.93	11.40	82.33	8.48	-3.40	.001
Experiential Subjective Life Expectancy	76.48	15.76	83.40	10.57	-5.23	.001
Projected Life Expectancy for Others	75.54	9.39	76.85	9.01	-1.51	. ns

Note. N in both groups = 202.

FIGURE 4


PARENTS ILL
PARENTS HEALTHY
SUBJECTIVE LIFE EXPECTANCY
90
85
80
75
70
65
60
55
50
"Best Guess"
(SLE/R)
"Personal Feelings"
(SLE/E)
"For Others"
(PLE/O)

Comparison of Subjective Life Expectancy Measures for the Four Groups

In order to give a general picture of the data on SLE, subjective life expectancy among the four groups which were part of the two studies was compared. The result are depicted in Table 6. The analysis of variances indicated significant differences between the groups on Projected Life Expectancy for Others, Rational Subjective Life Expectancy, and Experiential Subjective Life Expectancy. Post-hoc analyses using the Tukey multiple range test showed that the differences were in the expected direction: the two control groups (PH_1 and PH_2) did not differ from each other on any of these measures; PI subjects projected significantly lower Rational Subjective Life Expectancy and Experiential Subjective Life Expectancy for themselves than either PH_1 or PH_2 subjects, and significantly higher SLEs than PD subjects. The PD group differed significantly from all other groups on all three life expectancy measures; PD subjects predicted a shorter life span for themselves than did PI, PH_1, and PH_2 subjects.

Table 6

Subjective Life Expectancy for the PD, PH_1, PI, and PH_2 Groups

	Parent Deceased		Parent Healthy$_1$		Parent Ill		Parent Healthy$_2$		F	p
	M	SD	M	SD	M	SD	M	SD		
Rational Subjective Life Expectancy	72.00	11.97	82.80	8.55	78.93	11.40	82.33	8.48	37.72	.001
Experiential Subjective Life Expectancy	63.65	15.29	84.30	8.85	76.48	15.76	83.40	10.56	91.29	.001
Projected Life Expectancy for Others	81.00	10.61	75.13	8.95	75.54	9.39	76.85	9.01	13.49	.001

Note. Ns in the PD and PH_1 groups = 167; Ns in the PI and PH_2 groups = 202.

Health Behavior

As in Study 1, matched pairs t-test were computed to examine group differences between the PI and PH_2 groups concerning the five health behaviors. The analyses showed no significant differences regarding self-reported health behavior between the two groups.

Unrealistic Optimism

The results for unrealistic optimism are shown in Table 7. Subjects in both groups showed unrealistic optimism when making comparative risk judgements for the health problems. The only exception occurred in the PI group, in which subjects felt that they had a slightly greater chance of developing high blood pressure than comparable others (M = .07; SD = 1.7).

As in Study 1, the matched pairs t-tests were computed to examine group differences. The analyses showed that PI subjects reported significantly less unrealistic optimism developung diabetes, high blood pressure, and heart attack than PH2 subject.

Table 7

Comparative Risk Judgements concerning Health problems for PI and PH_2 Groups

	Parents Ill		Parents Healthy			
	PD		PH_1			
	M	SD	M	SD	t	p
Diabetes	-0.28	1.96	-0.96	1.87	3.55	.001
High blood pressure	-0.07	1.71	-0.22	1.73	1.81	.071
Lung cancer	-0.87	1.87	-1.08	1.86	1.13	ns
Breast cancer	-0.98	1.69	-.092	1.79	-.41	ns
Cancer in general	0.20	1.44	-0.43	1.64	1.54	ns
Heart attack	-0.02	1.60	-0.41	1.58	2.39	.018
Stroke	-0.58	1.45	-0.84	1.53	1.71	ns

Note. N in both groups = 202.

A negative value indicates unrealistic optimism, since it denotes a tendency to claim that one's own risk is less than comparable others.

Comparisons within the PI group

As in Study 1, PI subjects were divided into two subgroups according to whether or not they believed they would develop the same life-threatening illness as their parents. This division was accomplished by matching subjects' response concerning likely illness they will develop on the rational level (ILLSAME/R versus ILLDIFF/R), as well as their response on the experiential level (ILLSAME/E versus ILLDIFF/E), with the reported illness of the parent. The results of Study 1 were partially replicated in this sample. No differences were found on the life expectancy or health behavior measures between the group of subjects who believed that they would develop the same illness as they parent, and the group who believed that they would develop a different illness. There were also no differences between the two groups on the projected age of illness onset when reported on the experiential level. However, reporting on the rational level, subjects who believed that they would develop the same illness as their parents, predicted that they will develop a serious illness at a significantly younger age than the other group did. These results were true when subgroups were established on the basis of either rational set, $t(84) = -2.01$, $p = .05$, or experiential set, $t(69) = -2.4$, $p = .02$.

Summary of results

The primary purpose of Study 1 was to replicate the results of Denes and Ehrlichman (in press), and to establish more conclusively the link among premature parental death due to illnesses, reduced subjective life expectancy and poor health behavior. It also aimed to explore whether or not the lack of unrealistic optimism showed by those individuals regarding subjective life expectancy is also present when estimating risk for health hazards. Study 2 was designed to examine whether the findings of Study 1 are restricted to people whose parents died prematurely or would be similar for individuals whose parents are alive but developed an illness at a relatively young age that was perceived by the subjects as potentially life-threatening.

The results showed that subjects whose parents died prematurely anticipated a significantly shorter life span as compared to matched control subjects whose parents were alive and healthy. In addition, subjects whose parents died prematurely expected a shorter life span for themselves than for others in their cohort. These differences were observed for both "objective" judgments (rational) and "gut feelings" (experiential). As PD subjects' perception of the normative life span was significantly higher than that of controls, these results were magnified when personal life span predictions were adjusted for the perception of normative life span.

Subjective life expectancy of subjects whose parent had developed,

early in life, an illness that the subject perceived as life-threatening was significantly lower than subjects' whose parents were alive and healthy, but significantly higher than subjects' who have lost a parent prematurely. These results were obtained with the "rational" as well as with the "experiential" mind set. Interestingly, however, PI subjects' projections for the age when they might develop a serious illness did not differ either on the rational or the experiential levels from those of control subjects.

The reversal of unrealistic optimism found for subjective life expectancy in the PD group did not generalize to comparative risk judgements for health problems; with the exception of cancer in general, PD subjects showed an optimistic bias for all illnesses measured. However, the extent of the bias was significantly less than that of their matched counterparts on five out of the seven items measuring comparative health risks. A similar pattern was observed in the PI group. They believed that they have a slightly greater chance of developing high blood pressure than comparable others, but considerably less chance for developing other health problems. The extent of the bias, as compared to control subjects, was significantly less on three out of the seven health risk measures.

PD subjects also reported poorer health habits than matched controls: they exercised less, smoked more, and monitored their calorie intake less conscientiously. PI subjects did not differ from control subjects on any of

the self-reported health behaviors.

Contrary to expectations, whether or not subjects believed that they would die of the same cause as their parent, or develop the same life threatening illness had no effect on their life span predictions, health behavior, or comparative risk judgments concerning health problems. Moreover, no significant associations were found between subjective life expectancy and the age of the subject at the time of parental death, the particular illness the parent died of or the gender match between subject and the deceased parent.

DISCUSSION

The results replicate and extend previous work on a non-clinical population of college students who had lost a parent prematurely due to illnesses. The findings suggest that the experience of premature parental death is associated with assumptions about life not characteristic of the general population. Subjects whose parents died prematurely and matched comparison subjects differed significantly on indicators of subjective life expectancy, health protective behaviors, and comparative risk judgements for a variety of illnesses.

In this discussion I will first address each of these areas separately and then synthesize the findings to provide a better understanding of the long-term impact of premature parental death.

Subjective Life Expectancy

Subjects' whose parents had died prematurely projected a significantly higher life expectancy for others than did matched controls. They also believed that other people of the same age, race, sex, and socio-economic status would live significantly longer lives than they would; in contrast, control subjects projected a lower life span for comparable others than for themselves. PD subjects also anticipated a significantly shorter life span for

themselves as compared to matched subjects, and these differences were evident for both "objective" judgments and "gut feelings". In addition, while PH_1 subjects' "gut feeling" estimates about the length of their life were higher than their "objective judgments", PD subjects showed the opposite pattern: their expected longevity sharply decreased when "objectivity" was abandoned and "gut feelings" were the basis for life span estimations.

The three life expectancy predictions, that is, Projected Life Expectancy for Others, Rational Subjective Life Expectancy and Experiential Subjective Life Expectancy were highly correlated for subjects' in each of the four subgroups (all $\underline{r}$s $>.5$). However, the opposite directional relationship among these measures different groups suggests that while individuals might have a general perception of life expectancy, Projected Life Expectancy for Others, Rational Subjective Life Expectancy and Experiential Subjective Life Expectancy are distinct, separate concepts. Although these retrospective data do not allow us to draw causal inferences, they suggest several possibilities. Since the parents of the PD subjects died of illnesses which commonly believed to have a hereditary component, one might argue that the differences in subjective life expectancy could reflect a realistic appraisal of subjects' genetic vulnerability. In fact, as a group, PD subjects' Rational Subjective Life Expectancy was just slightly lower than the expected life span for their age group as predicted by the Bureau of Census

(1988; see Appendix D). Allowing for medical advancements since the time of their parents' death, the bereaved group might be quite accurate in their predictions of longevity. However, we are primarily interested in identifying the psychological mechanisms responsible for the differential perceptions of bereaved and non-bereaved subjects and not the accuracy of their predictions.

A possible clue to the dynamics at work may be gleaned from the discrepancy between subjective life expectancy and projected life expectancy for others. A considerable amount of evidence attests to the prevalence of illusions in normal human functioning (Fiske & Taylor, 1984; Perloff & Fetzer, 1986; Taylor, 1983; Weinstein, 1980, 1982, 1989). One widely accepted view proposes that psychological well-being is dependent on an accurate perception of reality (e.g., Maslow, 1950; Jahoda, 1958; Jourard & Landsman, 1980); another claims that perceptual biases are part of normal human functioning (Kahneman & Tversky, 1973). One of the biases commonly documented is individuals' tendency to demonstrate "unrealistic optimism" about their future, believing that their own chances of experiencing an undesirable event are much less than those of comparable others (Weinstein 1980, 1982, 1989). Several investigators have hypothesized (Perloff, 1983; Perloff & Fetzer, 1987; Weinstein, 1980, 1982, 1987) that people acquire illusions of unique invulnerability because

they compare themselves to inappropriate standards. For example, by relying on cognitive heuristics such as salience, availability and representativeness people tend to compare themselves to individuals who are at risk (either through their own actions or because of circumstances).

The findings concerning life span projections not only provide evidence to support this assumption, but also identify the prototype of the people used for comparison. Control subjects projected a significantly shorter life span for others than for themselves. Moreover, their prediction of longevity for others was almost identical to the PD group's own rational subjective life expectancy. Control subjects' point of reference for other people' life span may have been individuals at greater risk (e.g., who are less healthy, take poorer care of themselves, or have a family history of illness).

More relevant are PD subjects' longevity expectations for themselves and others, a pattern that was in the opposite direction to controls. PD subjects' predictions for others closely matched the controls' own Rational Subjective Life Expectancy; however, their prediction for comparable others was roughly ten years longer than their predictions for themselves. Contrary to what research on comparative risk judgments would suggests, PD subjects saw the ambiguous "other" as much better off than themselves. As the lack of optimistic biases about one's future have been found only among people who had previous personal experience with the same event

(Weinstein, 1989), PD subjects' predictions suggest an experiential knowledge of the event. Obviously, no one can have previous personal experience with his or her own death. However, several investigators contend that the phenomenon most implicated in the recognition of personal mortality is the death of a parent (Jacques, 1965; Neugarten 1968; Raphael, 1983). These data, showing that the experience of premature parental death not only eliminates "unrealistic optimism" but also reverses the perceived odds relating to subjective life expectancy, suggest that premature parental death can simulate previous personal experience.

Moreover, even if one accepts that PD subjects' Rational Subjective Life Expectancy is a reasonable projection of their life span and simply an indication of their belief that they will die at a relatively young age because of or family risk, the genetic vulnerability explanation cannot account exclusively for the findings concerning subjective life expectancy. If projections of a shorter life expectancy simply reflected subjects' consideration of their genetic vulnerability, one would expect no reduction from rational to experiential subjective life expectancy. Indeed, there would be no reason to expect the pattern for PD subjects to differ from that of PH_1 subjects, that is, PD subjects also should have a higher experiential than rational SLE. The fact that PD subjects' Experiential Subjective Life Expectancy is significantly lower than their Rational Subjective Life

Expectancy indicates that some other psychological mechanism is at work. Past research attempting to delineate the factors influencing subjective life expectancy has concluded that though subjects clearly make some calculations to arrive at their projected age of death, the computations do not account for the resultant SLE (Handel, 1968; Robbins, 1988; 1989). As those investigations used SLE as a single concept without differentiating between rational and experiential components, it is possible the ambiguity resulted from subjects' attempts to merge two separate, and possibly conflicting, levels of prediction into one coherent whole. The separateness of rational and experiential responses relating to the "death of another" is well-documented (Raphael, 1983). Although there may be an intellectual awareness of the reality and finality of the death of a loved one, experientially the most common immediate response is denial of death, and emotional acceptance of the finality of the separation is a long, painful, and gradual process following the cognitive recognition. The lack of confusion when subjects were asked to give "objective" and "gut level" predictions about their life span, and the different life span projections on the rational than experiential level, suggest that the distinction between the rational and experiential spheres relating to the "death of another" also holds for the "death of oneself." Raphael (1983, p.23) has also suggested that the death of a parent crosses the line between "death of another" and "death

of oneself"; it signifies not only the loss, but also the possibility of personal death, the threat to self, and the realization of personal mortality. The death of a parent, especially if it is unexpected or untimely, is a personal disaster that shatters beliefs in personal invulnerability, personal control, and a just world, and elicits a loss of belief in the basic security of the personal and physical world. The sense of one's personal invulnerability has been breached by the experience, and the possible loss of one's own life becomes a reality. The reduction from rational to experiential subjective life expectancy observed among PD subjects might be a logical consequence of the loss of the illusion of personal invulnerability, an illusion characteristic of individuals in the subjects' age group and clearly shown by controls.

An interpretation of our data based solely on belief in genetic predetermination is also weakened by the findings of the second study. While PI subjects predicted significantly longer life spans for themselves than for similar others, the sole dependent variable differentiating subjects whose parents are alive, but had a life-threatening illness, from comparable others whose parents were healthy, was subjective life expectancy. Moreover, PI subjects showed a similar pattern to PD subjects; their projected life span was lower than control subjects', and their experiential life expectations were lower than their rational expectations. These findings seem to validate the idea that while an individual's subjective life expectancy is anchored at

their belief of the normative life span, there are also distinct rational and experiential components which are influenced by different psychological dynamics. That is, while rational subjective life expectancy might be based on one's appraisal of their own genetic vulnerability, experiential subjective life expectancy might be a reflection of their basic assumptions about the world. Moreover, our data could be indicating that the actual death of a parent might not be necessary to bring about changes in basic assumptions about the world; the trauma of the mere possibility of a parent's imminent death might be sufficient to elicit some changes in one's experiential conceptual system (Janoff-Bulman, 1989; Epstein, 1991). These findings provide an empirical validation of Raphael's (1983) clinical observations that while the assumptive changes regarding security, invulnerability, and personal mortality are primarily elicited by parental death, parental illness when perceived as inevitably fatal, even when it does not lead to death, also can evoke (though to a lesser extent than death) an altered view of life, often geared to the fragility of existence.

If, indeed rational and experiential life span projections are governed by distinct psychological processes; the lower rational subjective life expectancy for PD subjects is being the consequence of their realistic appraisal of vulnerability or their belief in genetic predetermination, while their lower experiential predictions being a reflection of their early realization

of personal mortality, rational subjective life expectancy of those individuals' who had lost a parent prematurely through violent death should not differ from controls'. On the other hand, experiential SLE of all subjects who experienced premature parental death should show a similar pattern, regardless of the cause of parental death.

In order to test this hypothesis we performed a post-hoc analysis. Our base sample also included 29 respondents who lost a parent prematurely to some form of violent death, (murder, suicide or accident). Since suicide have been shown to have a genetic component (Kiev, 1977) the three subjects whose parent committed suicide was not included in the analysis. For the post-hoc analysis, we matched each of the remaining 26 subjects individually on gender, race, religion an age with subjects whose parents were alive and healthy. The results supported the second alternative. The rational life expectancy of those subjects' whose parents died violent deaths did not differ from the control group's. However, their experiential subjective life expectancy was significantly lower than the control group's, and did not differ from that of PD subjects (See Appendix E).

Taken together these findings imply that the experience or the real possibility of premature parental death elicits changes in the individual's assumptive world, transforming phenomenological understandings as well as

impacting on cognitive functioning.

Factors Influencing Subjective Life Expectancy Within the PD Group

Neither subjects' nor parents' age at the time of death, the gender match between the subject and the deceased parent, nor the particular illness the parent died of influenced subjective life expectancy. Moreover, in contradiction to our previous study (Denes & Ehrlichman, in press), PD subjects' life span projections were not influenced by their belief as to whether or not the cause of their own death would be the same as their parents'. Although this finding further erodes the validity of an explanation based exclusively on subjects' beliefs in genetic predetermination, it also provokes questions about the differential findings. Methodological differences between the two studies may be responsible for the discrepancy. First, the present investigation more than quadrupled the sample of the earlier study. Therefore, we are relatively confident that the present results are a more accurate reflection of the relationship. Second, in the present work, subjects were questioned about their prediction of the cause of their own death before any mention of their parents' death. In order to identify those who assumed that their cause of death would be that of their parents' we matched their answers with the reported cause of the parents' death. In the Denes and Ehrlichman (in press) study, a question was posed at the closing of the instrument asking for the extent respondents' believed

whether they would die of the same cause as their parents. It is possible that in order to achieve cognitive consistency, subjects reflected on their earlier responses regarding subjective life expectancy and health behavior, and answered the question accordingly.

Comparative Risk Judgements for Health Problems

As several researchers have proposed that positive illusions are adaptive under certain circumstances (Taylor & Brown, 1988), the question of whether premature parental death alters perceptions of vulnerability in general and eradicates optimistic bias altogether, or influences only perceptions of longevity, is an important one. As in previous work on perception of illness risk, participants demonstrated a pervasive tendency to view their own risk for a variety of illnesses as significantly below average (Kulik & Mahler, 1987; Perloff & Fetzer, 1986; Weinstein, 1980, 1982, 1983). The experience of premature parental death, however, was associated with diminished optimism. Comparisons between the PD and PH_1 group revealed significant differences in the extent of unrealistic optimism for five out of seven major illnesses. However, the group differences were smaller in magnitude than those relating to subjective life expectancy; with the exception of cancer there was no reversal of, only a reduction in bias. Moreover, it seems that these differences were mainly due to the fact that respondents took family history into consideration when judging their

personal susceptibility to particular illnesses: individuals whose parents had died of or presently suffered from cancer or heart disease judged their own chances of developing these illnesses as significantly higher than others' chances.

Health behavior

The fact that the experience of premature parental death is associated with a reduced perception of invulnerability is of interest of its own right; another important question is how the reduced perception of invulnerability affects health behaviors.

PD subjects reported health patterns which were considerably poorer than that of controls: they exercised less, smoked more, and monitored their calorie intake less carefully. PD subjects' fat consumption was also higher than controls, although it was not statistically significant.

Several epidemiological studies have revealed a robust relationship between the health habits discarded by this group and longevity (Breslow & Enstrom, 1980; Belloc & Breslow, 1972). Lack of exercise, cigarette smoking and poor eating habits were found to be the primary behavioral contributors to the incidence of both cardiovascular diseases and cancer (Kannel, 1983), the two major causes of parental death in this sample. Thus, the health-related lifestyle of these individuals could itself become a risk factor for early death, possibly serving as a self-fulfilling prophesy.

Therefore, it is essential to attempt to identify the psychological mechanisms behind the lack of health protective behaviors in the PD subjects; the understanding of the dynamics may direct us to components that can make prevention programs more effective.

Exploring the issue from different perspectives can offer two distinctive, though not mutually exclusive, interpretations of our findings. First we will examine the findings focusing on the proposed changes brought about by the experience of premature parental death in the individuals' assumptive world.

We are living in an age of discovered risk; we are bombarded with information about hazards to our health, hazards in the environment, in the genes, in our own behavior. Some risk factors such as family history of disease, ethnic group, age, and environmental hazards are not subject to modification; in fact only a very limited range of hazards are under our control (Kirscht, 1983). It has been suggested that without cognitive biases such as the illusion of control and personal invulnerability, individuals would conclude that their health is primarily determined by factors other than their own behavior and develop feelings of helplessness (Abramson, Seligman, & Teasdale, 1978). In fact, it has been shown that when people are faced with severe threats to which they feel extremely vulnerable they often resort to coping strategies which are detrimental to their health but are adaptive

psychologically, allowing them to relieve some anxiety. They exhibit hopelessness or fatalism, both of which denote an appraisal of the threat as inescapable, and a belief that there is no way of averting the danger. These coping strategies are also associated with counterproductive behaviors (Rippetoe & Roger, 1987).

One can speculate that PD subjects' lack of health protective behavior could be explained along these lines. If cognitive biases are necessary to feel in control of our own health, PD subjects who have indicated less of an illusion of personal control and invulnerability than control subjects, and might be realistically at risk for serious illnesses, could be exhibiting hopelessness or fatalism because they believe that their actions will have no real impact on their health or longevity. In general one would presume that individuals who are at risk are motivated to comply with behaviors proposed to reduce the risk; however, since outcome expectancies strongly influence behavior (Ajzen & Fishbein, 1980), even a sufficiently-threatened individual cannot be expected to accept the recommended health actions unless it is perceived by him/her as efficacious.

Implicit in this explanation is the idea that health behavior of bereaved and control subjects' would have been the same if not for the premature death of PD subjects' parents. However, in view of the retrospective and cross-sectional nature of our study one cannot discard the possibility that

there were significant differences in health patterns between the groups prior to the incident of parental death. As it has been shown that health patterns run in families and individuals acquire norms of health behavior in childhood (Coburn & Pope, 1974) that remain considerably stable through the lifetime (Mechanic, 1979), it is conceivable that the absence of health protective behaviors exhibited by our subjects is simply their family standard. From this perspective, the health behaviors observed on the PD group are not the consequence of, but in fact, may be a contributing factor to the premature parental death.

These results are related to the question of how much genetic risk reflects inherited biological vulnerability and how much of it is due to shared behavioral patterns. Since these questions can only be answered by a combination of longitudinal and cross-sectional studies that account for preexisting differences, as well as inquiring about behavioral changes subsequent to the parent's death, they will remain as issues for future research.

Although these two interpretations of PD subjects' health behavior may appear to challenge each other, they are really complimentary. PI subjects had health behaviors similar to those of control subjects. If, indeed, family health patterns contributed to the premature development of the life threatening-illness, PI subjects' present health behavior suggests a change

from those patterns. One can venture that, as the Health Belief Model (Becker, 1974) would predict, the parents' illness made subjects realize their personal vulnerabilities; therefore they became motivated to engage in preventive health behaviors. In order to avert the threat to their own health they established behavior patterns divergent from the family's life-style. However, no similar changes in health behavior followed parental death; PD subjects retained the poor family standards. A possible explanation for the different reactions to the threat by PI and PD subjects are the consequences of the previously hypothesized assumptive changes in world view provoked by the death. The realization of genetic susceptibility motivated PI subjects to live healthier lives; however, PD subjects experience of premature parental death also generated assumptions that people have little control over their fate and chance is a force to be acknowledged and accepted. Hence, the feelings of personal vulnerability might have provoked only helplessness and/or fatalism as oppose to corrective action. Of course, without information about family behavior patterns these interpretations are merely speculative.

Conclusion

The results presented here suggest that current theoretical approaches to early parental bereavement should be reexamined. One current view is that the experience renders the individual vulnerable to a multitude of serious

and enduring pathological states (Bowlby, 1980). Another theoretical approach regards the death of a parent as a role loss. According to this sociological model, the intensity of the consequences is determined by the availability and goodness of parental substitutes (Werner & Smith, 1982). Both approaches are interested in identifying the variables (psychological or sociological) that determine the extent of pathology resulting from early bereavement. It is implicit in these perspectives that the experience most likely will result in some form of pathology or alternatively, that long range consequences can be prevented by controlling for key factors.

Taken as a whole, the results presented here provide no support for either of these views. The consequences of early parental death are neither necessarily pathological nor restricted to pathology. Our population of college students showed no evidence of pathology; nevertheless they exhibited cognitive functioning indicative of assumptions about the world not characteristic of their age group. Based on clinical observations, Raphael proposed (1983) that parental death may produce changes in the individual's assumptive world; the cognitive concepts relating to the world and the self become altered by the loss (Horowitz et al., 1980). The notions of a "just world" (Lerner, 1965), the belief in the basic security of the physical and psychological world, the illusions of personal control and invulnerability, assumed to be shattered by the experience. These changes have been

attributed to the threat posed to the self by the parental death, and proposed to impact on personal reality of death.

Numerous studies in social, personality, clinical, and developmental psychology have documented the prevalence of enduring and systematic illusions relating to the self and the environment in normal human functioning. Most people have unrealisticly positive views about themselves, an exaggerated belief in their ability to control their environment, and underestimate their personal vulnerability in relation to others (Weinstein, 1980). These positive illusions have been proposed for the most part, to be adaptive, allowing people to reach beyond their grasp, to strive for goals which otherwise seem unsurmountable, and to help to avoid feelings of helplessness (Taylor and Brown, 1988).

PD subjects failed to show the positive illusions about their future that have been documented consistently in the general population and observed in the control group in the present study. In fact, concerning their life span they expected to live a significantly shorter life than they believed other people will. They also reported less optimistic bias than controls concerning their own chances of developing a serious illness. Moreover, we have observed what may be injurious consequences of the lack of illusions of control, self-efficacy, and invulnerability in relation to health behavior. PD subjects' poorer health practices, may reflect lessened motivation to engage

in health protective behaviors following from a feeling of helplessness towards increasing their chances for a longer life.

Future Directions for Research

These findings suggest a number of directions for future research. Because the major focus of this investigation was to identify the long-term non-pathological consequences of premature parental death, we selected a research design and a sample which permitted us to delineate a set of consequences we predicted as effects of this experience. Additional research is needed to examine more general ramifications of premature parental death, for example whether reduced usage of positive biases are restricted to health issues, or extend to other aspects of life. Moreover, as positive illusions have been associated with enhanced motivation, persistence and performance (Taylor & Brown, 1988) future studies need to examine more closely how their relative absence influences life goals and everyday functioning. In subsequent research it also will be important to determine whether or not the death of a parent has a unique influence on people's assumptive world, not paralleled by other significant losses. For example, would the death of a sibling, or alternatively the loss of a parent through divorce trigger similar changes? Research of this kind would not only serve to illuminate important conceptual issues, but would be also helpful in identifying those in special need of intervention efforts.

Appendix A

Demographic Characteristics of the Base Sample by Groups

	Base Sample		Parent Deceased		Parent Healthy$_1$		Parent Ill		Parent Healthy$_2$	
	N	%	N	%	N	%	N	%	N	%
Gender										
Female	1501	70.6	124	74.3	124	74.3	166	72.2	166	72.2
Male	623	29.3	43	25.7	43	25.7	64	27.8	64	27.8
Missing	1									
Ethnicity										
Asian	156	7.3	16	9.6	16	9.6	13	9.6	13	9.6
Black	379	17.8	41	24.6	41	24.6	34	16.7	34	16.7
Hispanic	355	16.7	25	15.0	25	15.0	31	15.2	31	15.2
White	1194	56.2	84	50.3	84	50.3	125	61.3	125	61.3
Other	27	1.2	1	.5	1	.5	1	.5		
Missing	14	.7								

	Base Sample		Parent Deceased		Parent Healthy$_1$		Parent Ill		Parent Healthy$_2$	
	N	%	N	%	N	%	N	%	N	%
Religion										
Catholic	1075	50.6	76	45.5	87	52.1	114	55.9	110	53.9
Jewish	274	12.9	23	13.8	20	12.0	29	14.2	30	14.7
Muslim	33	1.6	3	1.8	0	0.0	3	1.5	1	0.5
Protestant	494	23.2	49	29.7	47	28.1	47	23.0	49	24.0
Hindu	22	1.0	0	0.0	4	2.4	1	0.5	0	0.0
Agnostic	141	6.6	12	7.2	6	3.6	8	3.9	12	5.9
Buddhist	17	0.8	2	1.2	2	1.2	0	0.0	0	0.0
Missing	69	3.2	2	1.2	1	.6	2	1.0	2	1.0
Age										
Mean	23.84		25.66		25.76		23.08		22.80	
Range	16 - 66		17 - 47		17 - 49		16 - 44		16 - 42	

Appendix B

Procedure Used for Developing Matched Groups

The base sample consisted of 2,125 individuals. One hundred and seventy-two subjects lost a parent prematurely, andd 230 had a parent who have developed a life-threatening illness prematurely, leaving 1,723 eligible to be comparison subjects. The following groups of respondents were not regarded as appropriate controls, and therefore were not considered for the matched pairs for PD or PI subjects.

a) Subjects who have reported that they were not part of an intact family (N = 478)

b) Subjects who have stated that they have a serious illness (N = 94)

c) Subjects who have lost one or both of their parents due to accident, murder, or suicide (N = 29)

d) Subjects who have lost one or both of their parents due to illness after the parent was 55 years old (N = 80)

e) Subjects whose parents had a life-threatening illness which the parent developed after the age of 55 (N = 26)

The remaining 1,017 subjects constituted the population to be considered as matched pairs for PD and PI subjects. First each PD subject was randomly matched on several demographic variable with an individual from this population, the procedure was repeated for PI subjects. Priorities for matching were a priori established as follows:

1. Gender: Exact match was required in all cases.
2. Race: Exact match was attempted.
3. School affiliation: Exact match was attempted.
4. Age: Match within 5 years was attempted. Ten years maximum difference accepted.
5. Religion: Match was optional.

Appendix C

Questionnaire Used in the Study

PERSPECTIVES ON HEALTH AND ILLNESS

We are trying to learn about the ways different people view certain important health related issues, including serious illnesses. By "serious illnesses" we mean illnesses that are potentially life-threatening. We would very much appreciate it if you would share your beliefs, attitudes, and feelings with us. Your participation is entirely voluntary. The questionnaire is completely anonymous, and there is no way you can be identified.

Please read the questions carefully. Some of the questions ask you to provide information by filling in the blanks, others by circling the letter or number preceding the choice which best describes your feelings or situation. While you may not find the answer in every case which exactly states your feeling, please mark the one which comes closest to it. Please answer the questions carefully and honestly. It is important that you respond according to your actual beliefs and not according to what you feel you should believe or how you think we want you to believe. There are no right or wrong answers. As much as you can, try to respond to each item independently - try not to let your answer to one question influence your answers to other questions.

Some of you may find it upsetting to answer questions about serious illnesses. If you do not wish to participate or to continue your participation at any point, please remember that you are free to do so. As stated above, your participation is completely voluntary.

Please fill in the blanks

1. Given everything that is objectively true about me, my best guess is that I will live until the age of..... |__|__|__| 1-3

2. My "gut feeling" is that I will live until the age of..... |__|__|__| 4-6

3. I think that other people of my age, sex, race, and socioeconomic status can expect to live until the age of ..... |__|__|__| 7-9

4. Given everything that is objectively true about me, my best guess is that I will die of (Circle one)

   a. heart disease

   b. cancer (please specify).....

   c. stroke

   d. other illness (please specify).....

   e. accident

   f. homicide

   g. other (please specify)..... |__|__| 10-11

5. My "gut feeling" is that I will die of (Circle one)

   a. heart disease

   b. cancer (please specify).....

   c. stroke

   d. other illness (please specify).....

   e. accident

   f. homicide

   g. other (please specify)..... |__|__| 12-13

6. Given everything that is objectively true about me, my best guess is that I will not develop a serious (i.e. potentially life-threatening) illness until the age of ..... |__|__|__| 14-16

7. My "gut feeling" is that I will not develop a serious (i.e. potentially life-threatening) illness until the age of ..... |__|__|__| 17-19

8. I think that other people of my age sex, race, and socioeconomic status will not develop a serious (i.e. potentially life-threatening) illness until the age of ..... |__|__|__| 20-22

9. Given everything that is objectively true about me, my best guess is that if I develop a serious (i.e. potentially life-threatening) illness the illness will be:

   a. heart disease

   b. cancer (please specify).....

   c. stroke

   d. other illness (please specify).....|__|__| 23-24

10. My "gut feeling" is that if I develop a serious (i.e. potentially life-threatening) illness the illness will be:

   a. heart disease

   b. cancer (please specify).....

   c. stroke

   d. other illness (please specify).....|__|__| 25-26

Please circle the letter preceding the statement which best describes your feelings.

11. Generally speaking, my health is
    1. excellent
    2. very good
    3. good
    4. fair
    5. poor
    6. very poor |__| 27

12. Compared to other people of my age and sex, my chances of getting diabetes in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already have the disease |__| 28

13. Compared to other people of my age and sex, my chances of getting high blood pressure in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already have the disease |__| 29

14. Compared to other people of my age and sex, my chances of getting lung cancer in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already have the disease |__| 30

15. Compared to other people of my age and sex, my chances of getting breast cancer in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already have the disease |__|31

16. Compared to other people of my age and sex, my chances of getting any kind of cancer in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already have the disease |__|32

17. Compared to other people of my age and sex, my chances of having a heart attack in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already had a heart attack |__|33

18. Compared to other people of my age and sex, my chances of having a stroke in the future are
    1. much below average
    2. below average
    3. little below average
    4. average
    5. little above average
    6. above average
    7. much above average
    8. I already had a stroke |__|34

Please circle the letter preceding the statement which best describes you

19. I engage in vigorous exercise
    1. every day
    2. every other day
    3. two to three times a week
    4. once a week
    5. two or three times a month
    6. never |__|35

20. I smoke cigarettes
    1. 2 or more packs a day
    2. between 1 and 2 packs a day
    3. 1 pack a day
    4. 1/2 pack a day
    5. less than 1/2 pack a day
    6. not at all |__|36

21. I usually have liquor, beer, or wine
    1. not at all
    2. only on special occasions
    3. only on weekends
    4. three or four times a week
    5. once a day
    6. more than once a day |__|37

22. I eat whatever I want regardless of calories
    1. strongly disagree
    2. moderately disagree
    3. slightly disagree
    4. slightly agree
    5. moderately agree
    6. strongly agree |__|38

23. I keep the fat in my diet to a minimum
    1. strongly disagree
    2. moderately disagree
    3. slightly disagree
    4. slightly agree
    5. moderately agree
    6. strongly agree |__|39

24. Please state all the things you do to protect your health. List as few or as many as appropriate.

1.....

2.....

3.....

4.....

5.....

6.....

7.....

8.....

9.....

10.....

We would also like know a little about your background in general and about your family's medical history in particular.

25. What is your gender?

a) Female

b) Male |__| 44

26. What is your ethnicity? (Please circle all that apply)

a) American Indian

b) Asian, Pacific Islander

c) Black, not of Hispanic origin

d) Hispanic

e) White, not of Hispanic origin |__| 45

f) Other (please specify).....

27. What is your religion?

a) Catholic

b) Jewish

c) Muslim

d) Protestant

e) Hindu

f) Other (please specify)..... |__| 46

28. How old are you ? I am .....years old. |__|__| 47-48

29. Do you currently have a serious (i.e. potentially life-threatening) illness?

a) no |__| 49

b) yes, I have (Please name the illness).....|__|__| 50-51

The following questions ask about your family history. In answering them, please refer to your biological mother and biological father.

30. Is your mother alive?

a) yes b) no

IF NO, please skip to question 33. |__| 52

IF YES, complete questions 31 and 32

31. How old is your mother ? She is .....years old. |__|__| 53-54

32. Does she currently have a serious (i.e. potentially life-threatening) illness?

a) no

b) yes |__|55

IF YES:

She has (Please name the illness)..... |__|__|56-57

She developed this illness at the age of.....

when I was .....years old. |__|__|__|__|58-61

She also has (Please name the illness)..... |__|__|62-63

She developed this illness at the age of.....

when I was .....years old. |__|__|__|__|64-67

Now please skip to question 37.

IF YOUR MOTHER IS NOT ALIVE:

33. She died at the age of ..... |__|__|68-69

At the time I was.....years old. |__|__|70-71

34. The cause of her death was (Circle one):

a) illness

b) old age

c) accident

d) homicide

e) suicide

d) other *(please specify)*

..... |__|__|72-73

If the cause of her death was not an illness, please skip to question 37.

If the cause of her death was an illness, please continue with the next question

35. The name of the illness my mother died of is: (Please be as specific as you can

.....|__|__| 74-75

36. She was ..... years old when she first developed this illness.|__|__| 76-77

37. Is your father alive?

a) yes b) no |__| 78

IF NO, please skip to question 40. |__| 79

IF YES, complete questions 38 and 39.

38. How old is your father ? He is .....years old. |__|__| 80-81

39. Does he currently have a serious (i.e. potentially life-threatening) illness?

a) no |__| 82

b) yes

He has (Please name the illness).....|__|__| 83-84

He developed this illness at the age of.....

when I was .....years old. |__|__|__|__| 85-88

He also has (Please name the illness)..... |__|__| 89-90

He developed this illness at the age of.....

when I was .....years old. |__|__|__|__| 91-94

Now please skip to question 44.

IF YOUR FATHER IS NOT ALIVE:

40. He died at the age of .....

At the time I was.....years old.

41. The cause of his death was (Circle one):

a) illness

b) old age

c) accident

d) homicide

e) suicide

d) other (please specify)

..... |__|__| 99-100

If the cause of his death was not an illness, please skip to question 44.

If the cause of his death was an illness, please continue with the next question

42. The name of the illness my father died of is: (Please be as specific as you can)

.....|__|__| 101-102

43. He was ..... years old when he first developed this illness.|__|__| 103-104

44. Is there any life-threatening illness that you feel that your family is especially prone to? For example, is there an illness that more than one family member has or had?

a. No

b. Yes, I feel that |__| 105

a) males and females in my family are prone to

(Please name the illness)..... |__|__| 106-107

(Please name the illness)..... |__|__| 108-109

b) females in my family are prone to

(Please name the illness)..... |__|__| 110-111

(Please name the illness)..... |__|__| 112-113

c) males in my family are prone to

(Please name the illness)..... |__|__| 114-115

(Please name the illness)..... |__|__| 116-117

45. Have you ever discussed with your physician or with any other health care professional whether you are at risk of developing a specific illness?

A. No, I don't believe it is important |__|__|__| 118-119

B. No, I would have liked to but never had a chance

C. Yes, I discussed it with .....

IF NO, skip to question 51.

IF YES, please answer questions 46 through 51.

46. Did the person advise you that you are at risk of developing a specific illness?

a. No

b. Yes, the illness s/he mentioned was

..... |__|__| 120-121

47. Did the person explain to you why you are at risk?

a. No

b. Yes, I was told

.....

.....

.....|__|__|__| 122-123

48. Did the person explain to you how great the risk is?

a. No

b. Yes, I was told it is a *(Circle one)*

1. mild risk

2. moderate risk

3. serious

4. very serious risk

|__|__| 124-125

49. Did the person tell you what you can do to decrease the risk?

a. No

b. Yes, I was told..... |__|__|__|126-128

.....

.....

50. Did you follow his or her recommendations about how to reduce the risk?

a. Yes, I do now

b. Yes, at first, but I don't anymore, because.....

.....

.....

c. No, I don't, because.....

.....

..... |__|__|__|129-130

51. Did you live with both of your parents until the age of 18?

a) yes b) no |__|131

MANY THANKS FOR FILLING OUT THIS QUESTIONNAIRE

Appendix D

Actuary and Subjective Life Expectancy For PD and PH_1 Groups According to Gender and Race

	Parents Deceased				Parents Healthy			
	White Male	White Female	Non - White Male	Non - White Female	White Male	White Female	Non - White Male	Non - White Female
	N = 22	N = 62	N = 22	N = 61	N = 22	N = 62	N = 22	N = 61
Expected Life Span,	73.3	79.8	67.4	75.3	73.3	79.8	67.4	75.3
SLE/R	71.6	73.1**	71.3	71.3*	83.0**	82.6*	83.9**	82.6**
SLE/E	59.6**	63.5**	62.7	63.6**	82.9**	85.5**	84.3**	83.5**
PLE/O	76.3	82.3*	84.7**	80.0*	76.4*	77.7*	76.0**	71.7*

Note. , U.S. Bureau of Census 1988

* $p < .05$, two tailed from Expected Life Span

** $p < .001$, two tailed from Expected Life Span

Appendix E

Means and Standard Deviation for Rational Subjective Life Ecxpectancy and Experiantial Subjective Life Expectancy

	Parents Deceased By Violent Death		Parents Healthy Control			
	M	SD	M	SD		
Rational Subjective Life Expectancy	76.00	12.34	79.81	7.81	-9.94	.001
Experiential Subjective Life Expectancy	64.92_a	18.23	82.31_a	10.21	-14.7	.001

Note. N in both groups = 26.

Means bearing the same subscript are significantly different from each other on the $p < .001$ level.

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