

# Risk Perception and New Age Beliefs

Lennart Sjöberg<sup>1\*</sup> and Anders af Wåhlberg<sup>2</sup>

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This is a study of risk perception in relation to New Age (NA) beliefs, including traditional folk superstition and belief in paranormal phenomena, as well as use of alternative healing practices. Data were also obtained on trust dimensions and on personality and psychopathology variables, as well as religious involvement. It was found that four factors accounted for the investigated NA beliefs, which were termed higher consciousness beliefs, denial of analytic knowledge, traditional superstition, and belief in the physical reality of the soul. NA beliefs were strongly and positively related to religious involvement, and negatively to educational level. These beliefs were also positively related to maladjustment and to concerns over tampering with nature. In regression analyses, it was found that NA beliefs explained about 15% of the variance of perceived risk, and that the most powerful explanatory factors were higher consciousness beliefs and beliefs in paranormal phenomena. Traditional superstition and use of healing practices did not contribute to explaining perceived risk.

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**KEY WORDS:** New Age; risk perception; trust; psychopathology

## 1. INTRODUCTION

The perception of technology and environment risks is of interest partly for its possible relationship to social policies. The reasons people perceive a technology to be risky are due to several factors beyond actual accident and fatality rates. Well-known approaches to risk perception include the psychometric model and cultural theory or worldviews (Douglas & Wildavsky, 1982; Fischhoff *et al.*, 1978; Peters & Slovic, 1996). The power of these models is under discussion (Sjöberg, in press-a). Here it is sufficient to note that the models do not provide answers to *all* the questions regarding perceived risk. The level of explained variance of perceived risk is about 20–25% for the psychometric model and 5–10% for cultural theory or worldviews.

This article starts with the observation that skepticism toward modern science and technology appears to have some of its roots in the cluster of values, beliefs, and attitudes often somewhat loosely summarized under the heading of New Age. The purpose of the article is to investigate the importance of New Age beliefs for risk perception. We do so by first reviewing the phenomenon of the rise of New Age beliefs since the 1960s and discuss the causes of these beliefs. Then we proceed to an empirical study where the structure of New Age and some related beliefs are investigated and their role in accounting for risk perception is mapped.

## 2. THE AGE OF AQUARIUS

In the last decades, a new movement with old roots has emerged in Western countries. The movement is often traced to the counterculture of the 1960s (Taylor, 1999), but its roots are much older (Melton, 1988), and it has in its current version largely distanced itself from political activism and drugs. It is often called New Age (NA) after one of its central

<sup>1</sup> Center for Risk Research, Stockholm School of Economics, Sweden.

<sup>2</sup> Department of Psychology, University of Uppsala, Sweden.

\* Address correspondence to Lennart Sjöberg, Stockholm School of Economics, Box 6501, 11383 Stockholm, Sweden; lennart.sjoberg@hns.se.

tenets: that we are on the verge of entering a new age where humans will operate on “a higher level of consciousness” with startling results for individuals and society (Ferguson, 1980; Hanegraaff, 1995). At its core, the movement deeply mistrusts science, realism, and objectivity (Sebald, 1984), and hence it is a social force that may be important in risk discourse and for understanding technology opposition.

The NA movement has some of its modern roots in the occult and esoteric teachings of the theosophians of the 19th century (Campbell, 1980; Melton, 1988) and in Eastern religiosity, but it also claims to be influenced by modern science, especially quantum mechanics (Capra, 1991), relativity, and evolution theory.

Science can be popularized to the point where it is close to superstition (Burnham, 1987). An interesting example is provided by a discussion of the pseudoscientific notions of “aquatic apes” (Langdon, 1997). Langdon stressed the sweeping character of a pseudoscientific “explanation”; similar claims are made by proponents of natural medicine who embrace fuzzy concepts of “wholeness,” which seems to explain everything and nothing, and support a multibillion-dollar industry (Hines, 1988) selling “cures” of very doubtful value (American Medical Association, 1993; Beyerstein, 1990). Similar criticism has been made of many New-Age-type approaches to learning (Swets & Bjork, 1990). There are also connections to the environmental movement, as the New Age way of seeing Earth as a living being (Gaia, see Lovelock, 1995) fits in well with the aim of rescuing it from the “human marauders” (Hanegraaff, 1995).

The NA movement also entails many very old folk religion practices and thoughts. The worldview of a New Ager seems to be very different from that of an atheist. While the atheist sees the world as governed by physical forces that can be measured and controlled by technological means, the New Ager sees a world of strange energies, spirits, even aliens (Sagan, 1996) and other metaphysical phenomena. To some it may seem a frightening world, but for the New Ager, it is, on the contrary, a world full of positive possibilities where anyone can reach a higher level of consciousness and functioning (Kyle, 1995).

New Age beliefs and practices differ from organized religions. *All* gods can be believed in (although not necessarily worshipped, and they are not always seen as personal), and none is seen as better than any other. There is no exclusivity. But these gods are not central to the New Age beliefs, man is. There is a very strong belief in the possibilities of the self. In fact, it

seems almost as if everyone can be a god because everybody has part in the “god-essence” (Hanegraaff, 1995).

The concepts of reincarnation and karma are central to some New Agers. Souls are reborn according to their deeds in earlier life, but this is viewed positively, not as a curse as in Buddhism or Hinduism. Astrology is also an important part of the movement (Fichten & Sunerton, 1983). Traditional religious beliefs have much in common with NA. It might be believed that the two are competing, but a positive correlation was found in one study where NA beliefs were related to traditional (Christian) religious beliefs (Tobacyk & Wilkinson, 1990). However, others have not been able to replicate this finding (Sparks, 2001).

Apart from paranormal beliefs endorsed by New Agers, there are also the everyday magic beliefs that seem to exist in all societies. In Sweden we have a rich heritage of superstitions. Some of these we share with other Western countries (fearing the number 13, black cats, etc.), while others seem to be peculiar to the country, or even to a very small region (Schön, 1989).

Scales of superstition date back at least to the 1920s (Nixon, 1926), having been preceded by more open procedures (Conklin, 1919). Several contemporary polls have made it clear that belief in astrology, ghosts, and other nonreligious metaphysical concepts is very common. This is a trend that is similar in many countries, for example, the United Kingdom and the United States (Davies, 1988; Duncan, Donnelly, & Nicholson, 1992; Gaynard, 1992; West, 1995), Australia (Grimmer & White, 1990), Switzerland (Pfeifer, 1994), Finland (Tobacyk & Pirttilaa-Backman, 1992), Poland (Tobacyk & Tobacyk, 1992), Canada (Ross & Joshi, 1992), New Zealand (Clarke, 1991), and post-Soviet Russia (Kapitza, 1999). Some of the results of surveying the prevalence of paranormal beliefs are truly astonishing. MacDonald (1994) reported that about 60% of U.S. samples in 1989 reported experience with telepathy, 40% reported contact with the dead, and some 20% reported clairvoyance. As many as 30% of a Scottish sample had attended readings solicited from professional psychics and many had been very impressed (Roe, 1998). Swedish data cited by Frisk (1996) point to beliefs in astrology, aliens visiting Earth, and reincarnation as being wholly or partly embraced by about 20% of the population. About 60% believed in some kind of god, most often in terms of a spiritual power rather than a personal god.

Age and gender have been found to have some relationship to reports of paranormal experiences,

young people giving more frequent reports of *deja vu* and more frequently regarding themselves as superstitious (Opie & Opie, 1959). Women report paranormal experiences more often than do men (Blackmore, 1997; Fox, 1992), and also believe more frequently in various healing practices (Furnham, 1994; Levin & Coreil, 1986; Parks, 1998). Education and intelligence are negatively related to superstitious beliefs, as is socioeconomic status (Plug, 1976).

Background factors may interact with level of commitment and involvement (Frisk, 1996). Frisk's study was based on data from 215 persons who had taken part in various New Age activities. They were of middle age and predominantly women. About half were college educated, which is vastly more than the general population. They tended to believe in God (however, usually not the Christian concept of a personal god), a life after death, and they were much preoccupied with "the meaning of life." Many believed in astrology. A large percentage (about one-third) of them were vegetarians. Frisk states that they were much less interested in drug use than members of new religious movements. She also found that there were two major groups of New Agers: those oriented toward the occult and intuition, and those oriented toward therapy, Eastern philosophy, and various intellectual developments. These notions seem to be related to, but somewhat different from, Lindeman *et al.*'s (Lindeman, Keskivaara, & Roschier, 1999) notion of two paths to magical thinking: emotional instability (especially among men) or intuitive thinking style (especially among women).

### 3. WHY NEW AGE, PARANORMAL, AND SIMILAR BELIEFS?

There is a strong connection between paranormal belief and reported paranormal experiences (Blackmore, 1982; Glicksohn, 1990; Myers *et al.*, 1983). What is cause and effect here is hard to tell, but a probable explanation is that a proneness to fantasy makes it easier to interpret a strange event as paranormal in nature, which in its turn has an impact on beliefs, which subsequently makes it even easier to see events as metaphysical.

Fantasy proneness has been found to be associated with paranormal beliefs (Irwin, 1985, 1990). There is some evidence for a relationship between paranormal beliefs and maladjustment (Tobacyk, 1991). Lawrence *et al.* (1995) found a relationship between childhood trauma reports and paranormal beliefs and experiences, and so did Irwin (1992, 1994a).

The trauma hypothesis is also supported by a study of a population sample in Canada (Ross & Joshi, 1992) and by Lillqvist and Lindeman (1998) in their study of astrology interest and beliefs. The experience of traumas, especially recent crises, was found to be related to belief in astrology in the study by Lillqvist and Lindeman (1998).

Lindeman, Keskivaara, and Roschier (1999) focused on magical beliefs related to food and nutrition. They found a gender difference, as expected, and also a correlation with neuroticism, low sensation seeking (Zuckerman, 1994), endorsement of universalism values (Schwartz & Bilsky, 1990), and experiential thinking (Epstein, 1994; Epstein *et al.*, 1996).

A major approach to explaining superstitious behavior is found in experimental psychology and Skinner's (1948) discovery of "superstition" in pigeons. Vyse (1997) stresses the relevance of this phenomenon of animal learning to human behavior and its reinforcement in group behavior, for example, in sports, which has often been noted (Bleak & Frederick, 1998) or in gambling (Toneatti, 1999). Superstitions may, at times, simply be behavior to get reinforcements previously associated with that behavior. If you do a certain thing, for example, you are likely to receive intermittent reinforcement, and such a schedule is known to lead to behavior that is likely to remain for a long time even if no new reinforcements are forthcoming. However, these principles pertain foremost to behavior, not to beliefs. A related approach is Campbell's (1996), who saw "modern" superstitious behavior as a reaction against helplessness.

One common explanation relates superstitious beliefs to death anxiety and the need to find comfort in beliefs about a life after death (Schumaker, 1990; Becker, 1973; Persinger & Makarec, 1990) and to "terror management theory" (Solomon, Greenberg, & Pyszczynski, 1991). Some pertinent empirical evidence related to this hypothesis was presented by Lange and Houran (1997) and by Keinan (1994). Long ago, Dresslar stressed fear, combined with animistic beliefs, as a main factor in superstition (Dresslar, 1910).

An interesting paper by Lindeman (1998) outlined a theoretical approach based on the idea that pseudoscientific beliefs serve the need for control (Shapiro, Schwartz, & Astin, 1996) and understanding of the world and oneself. The latter factor was also proposed by Dresslar (1910). Shermer (1997) suggested essentially the same explanations of "why people believe weird things." Pseudosciences excel in promising us explanations and easily comprehended, simple worldviews. They also flatter our self-esteem

and promise good times, as done, for example, by astrology (Lillqvist & Lindeman, 1998). It should be added that NA and related beliefs also provide answers to existential questions about the meaning of life, life after death, and so forth, just as traditional religion does.

A different approach has its roots in cognitive psychology. Pseudoscientific beliefs are developed and sustained due to limitations of cognitive capacity, which make us use certain heuristics rather than perform a full and nonbiased assessment of hypotheses, according to Lindeman's (1998) analysis. Other forms of irrational thinking may also be implicated (Roig *et al.*, 1998). The heuristics function in a cognitive mode called experiential, i.e., people base their beliefs on personal experiences. And personal experiences are by necessity a very unreliable source of information. Some support for a relationship between paranormal beliefs and irrational thinking was provided by Roig *et al.* (1998).

A book by Gray (1991) gives an excellent philosophical discussion of NA and points to a number of reasons why people come to hold such beliefs. His proposed psychological tendencies are worth repeating:

- Enjoying an exciting story.
- Wishful thinking.
- Seeing a cause when there is none.
- Belief in what we see and feel.
- Faulty observation.
- Seeing meaning when there is none.
- Naiveté (“I don't cheat so why should others?”).

Sociological perspectives were suggested by Tiryakian (1974a, 1974b). This work was published quite early during the modern revival of occult and NA beliefs. Tiryakian argued that there was a transmission from extreme left beliefs to NA beliefs, and also that the NA movement, just like the extreme left, was a protest against the modern establishment. If that analysis is correct, we have an obvious link between NA and the perception of risks of modern technology.

Modern concerns about technology date to the same time period that saw the rise of New Age beliefs and are thus relatively new. However, negative reactions to contemporary society and civilization go back as far as antiquity and its myths of a “golden age” when people were believed to have lived in complete harmony with themselves, each other, and nature (Thornton, 1999). Selfishness and greed destroyed this beautiful state of affairs. Concerns over

the evils of society and people have a very long history and seem to have a common core over the centuries. The concrete targets of concern change when society and technology change.

#### 4. PURPOSE OF THE PRESENT STUDY

The present study is an investigation of the relationship between risk perception and beliefs in New Age concepts, the supernatural, and superstition. Traditional religious beliefs are also investigated. It is hypothesized that those who hold NA and traditional religious beliefs regard technology risks as larger than those who do not.

The technology versus nature theme mentioned above as a background to many important hazards is a justification for looking closely at the beliefs that characterize people who have rejected the scientific and technological worldview, in whole or in part. It can be expected that such people also view risks as particularly large. The hazards studied here are mainly those due to interplay between technology and the environment. Technology is a product of science and the antithesis of these modes of thinking; it is a product of analytic thinking. Technology is also a way of exercising power over nature, of tampering with nature.

Previous studies have explored the importance of this factor for risk perception (Sjöberg, 1996, 2000) and it has turned out to be an important factor adding some power to the traditional psychometric model (Sjöberg, 1996) of risk perception.

In this article a few possibly related factors are also investigated: personality and trust. Trust and risk perception have been investigated in a number of studies (Cvetkovich & Löfstedt, 1999; Earle & Cvetkovich, 1995; Siegrist, Cvetkovich, & Roth, 2000; Sjöberg, 1999, 2001) and a moderately strong relationship is consistently found. Personality has been little studied in relation to risk perception (see Källmén, 2000 for an exception). These factors were added in the design in order to create a context in which any relationships between NA beliefs and risk perception could be compared to the effects of other factors. Trust and personality are also of inherent interest in the study of risk perception.

#### 5. METHOD

An extensive questionnaire was constructed for the present study and mailed to a sample of respondents who were approximately representative

of the Swedish population. The questionnaire contained several sections measuring risk perception, New Age and related types of beliefs, and personality.

### 5.1. Trust and Risk Perception Scales

Items used earlier in many questionnaires at the Center for Risk Research were compiled for this study. They concerned technological and environmental as well as everyday hazards, 34 in all. They were judged on a 0–7 category scale where 0 denoted “nonexistent risk” and 7 “a very large risk.” Respondents could also check a “don’t know” category. Each hazard was first judged as a personal risk, “the risk to you personally,” and then as a general risk, “the risk to people in Sweden in general.”

A subset of 19 hazards were judged in terms of how serious the risk was and how important it was for the government (national or local) to mitigate them. Then followed a section where 24 scales of the type used in applications of the psychometric model, extended with new tampering with nature items (Sjöberg, 2000), were to be applied to the rating of (1) genetically engineered food, (2) a local repository for high-level nuclear waste, and (3) climate change due to the greenhouse effect. The new items were used to enhance the psychometric model to a form termed the “extended psychometric model.”

Items devised in an earlier study for the measurement of trust (Sjöberg, 1999) were included in the subsequent section, 42 items measuring four factors: trust in corporations, trust in politicians, belief in the general honesty of people, and beliefs about the prevalence of social harmony.

### 5.2. New Age and Religious Involvement Scales

To measure the possible connection between paranormal beliefs and risk perception, different scales in common use were employed. Items from the Revised Paranormal Belief Scale (RPBS) by Tobacyk (1988) were used. The RPBS is an instrument in common use in the parapsychological area (Irwin, 1992, 1994b; Tobacyk & Wilkinson, 1991). It was complemented with the Swedish Religious Orientation Scale (SROS II) by Hovemyr (1996), which is mainly made up of translated items from American scales (Allport & Ross, 1967; Batson & Ventis, 1982; Hoge, 1972), tested in the Swedish religious environment and found to have satisfactory psychometric qualities; 22 items were included. It measures intrinsic and extrinsic religious orientation (faith

for its own sake or for what it leads to), and religious quest (faith as a factor in approaching existential questions such as the meaning of life).

The different scales mentioned above were supplemented with items about New Age beliefs and activities and folk superstition. The New Age questions were constructed from a survey of the available market of New Age seminars, therapies, books, and courses in Stockholm. A few superstition items were common beliefs in the Swedish society with a long history (Tillhagen, 1982). They were added to the Tobacyk scale superstition items. All these items pertain to beliefs that have been common in Sweden.

In a special section, subjects were asked to rate how often they had used each of 29 forms of healing and alternative medicine (see Appendix), and in still another section they were asked about their degree of belief in each of nine paranormal phenomena (see Appendix).

### 5.3. Personality Scales

Eysenck’s MPI (Eysenck, Eysenck, & Barrett, 1985) Scale containing 48 items, and items measuring paranoia and schizoid thinking (six and nine items, respectively) from the SLC-90 Scale (Derogatis, Lipman, & Covi, 1983) were used.

### 5.4. Respondents

The questionnaire was sent to 250 people who in earlier studies had indicated their willingness to participate in further research. They were originally part of a larger national sample, randomly chosen to be representative of the whole Swedish population. The number of respondents was 151, a response rate of 60.4%.

Of the respondents, 48.3% were men, 51.7% women. Their median age was 44 years, and median household income SEK 25,000/month (approximately U.S. \$3,000). Only 19.1% stated that they lived alone, and 67.6% had children. The percentage with a college degree was 27.6, while 10.5% had only primary school. Full-time employment was reported by 52.3%, 15.2% reported part-time work, 9.3% were full-time students, and 5.3% were unemployed.

About 11% (10.7%) stated that they were actively practicing a religion and 68.1% checked the state Protestant church as their religion. The respondents were quite evenly divided when it came to political inclination. Most lived in medium or large cities. About 80% reported that they and their family were

in good health. Nonsmokers constituted 74.7% of the sample, while 21.2% abstained from alcohol. The rest reported mostly very moderate alcohol habits.

On the whole, the group consisted of widely varying respondents and differed clearly from the general population mostly in being more highly educated (about a 10% overrepresentation of college-educated respondents). In previous work we have found the present type of sample to give results quite similar to those of a random sample of the population (Viklund, 1999), but the overrepresentation of respondents with a college education may have introduced some bias, to be discussed below when relevant.

**6. RESULTS**

**6.1. Analysis of New Age and Superstition Beliefs**

The 89 items measuring NA and superstition beliefs were factor analyzed. Four factors accounting for 43% of the total variance were extracted and subjected to direct oblimin rotation. No clear evidence of a meaningful fifth factor was found. Factor loadings are given in Table I. Oblimin was used because there was a moderately strong tendency for factors to be correlated. The largest correlation was 0.33, between Factors 1 and 4. Factor intercorrelations are given in Table II.

The factors were readily interpreted as:

- Higher consciousness beliefs.
- Belief in the physical reality of the soul.
- Denial of analytic knowledge.
- Traditional folk superstition.

In addition, two more indices were formed, measuring beliefs in paranormal phenomena and use of alternative therapy forms. These indices were based on additional items.

The items measuring these concepts are reproduced in the Appendix, as well as Cronbach's alpha values for the scales. The latter were quite satisfactory. This fact supports the stability of the factor analysis, in spite of the relatively small sample size.

**6.2. Psychometric Factors**

In three cases, a full set of psychometric items was included in the questionnaire: genetic engineering, nuclear waste, and climate change. The 24 items were factor analyzed, resulting in all cases in three or four factors that were quite similar in content. Table I

**Table I.** Factor Analysis of Climate Risk Ratings, Pattern Matrix

| Variable   | Factor |      |      |       |
|--|--------|------|------|-------|
|  | 1      | 2    | 3    | 4     |
| Sure to kill   | 0.94   |      |      |       |
| Likely to damage animals   | 0.80   |      |      |       |
| Likely to damage plants  | 0.79   |      |      |       |
| Likely to cause cancer   | 0.75   |      |      |       |
| Likely to contaminate food                                       | 0.73   |      |      | 0.34  |
| Likely to have immediate consequences                            | 0.70   |      |      |       |
| Likely to injure children and future generations                 | 0.69   |      |      |       |
| Likely to have large consequences                                | 0.66   |      |      |       |
| Irreversible effects   | 0.62   |      |      |       |
| Likely to have increasing effects over time                      | 0.60   |      |      |       |
| Is a warning about worse to come                                 | 0.46   |      | 0.41 |       |
| Very much feared   | 0.42   |      | 0.42 |       |
| Hard to understand to those exposed                              |        | 0.75 |      |       |
| Little known by science  |        | 0.70 |      |       |
| New risk   |        | 0.70 |      |       |
| Involuntary  |        | 0.39 |      |       |
| Results from "unnatural" activity                                |        |      | 0.94 |       |
| Human interference with order of nature                          |        |      | 0.84 |       |
| Results from activity contrary to nature                         |        |      | 0.80 |       |
| Results from human arrogance                                     |        |      | 0.80 |       |
| Illustrates how disasters can follow if we interfere with nature |        |      | 0.79 |       |
| Likely to have effects undetectable to human senses              |        |      | 0.58 |       |
| Unfair and immoral   |        |      | 0.54 |       |
| Hard to avoid  |        |      |      | -0.66 |
| Percentage of common variance accounted for                      |        |      |      |       |

Note: Loadings in the interval -0.39 to +0.39 deleted.

gives the results for climate change and four factors, which accounted for 73.4% of the variance. Direct oblimin rotation was used to produce the pattern matrix of the table, all loadings between -0.3 and +0.3 have been deleted. It is seen that the fourth factor

**Table II.** Correlations of NA factors

|          | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|----------|----------|----------|----------|----------|
| Factor 1 | 1.00     |          |          |          |
| Factor 2 | 0.26     | 1.00     |          |          |
| Factor 3 | 0.10     | 0.14     | 1.00     |          |
| Factor 4 | 0.33     | 0.31     | 0.09     | 1.00     |

**Table III.** Factor Analysis of Climate Risk Ratings, Pattern Matrix

| Variable   | Factor |      |      |       |
|--|--------|------|------|-------|
|  | 1      | 2    | 3    | 4     |
| Sure to kill   | 0.94   |      |      |       |
| Likely to damage animals   | 0.80   |      |      |       |
| Likely to damage plants  | 0.79   |      |      |       |
| Likely to cause cancer   | 0.75   |      |      |       |
| Likely to contaminate food                                       | 0.73   |      |      | 0.34  |
| Likely to have immediate consequences                            | 0.70   |      |      |       |
| Likely to injure children and future generations                 | 0.69   |      |      |       |
| Likely to have large consequences                                | 0.66   |      |      |       |
| Irreversible effects   | 0.62   |      |      |       |
| Likely to have increasing effects over time                      | 0.60   |      |      |       |
| Is a warning about worse to come                                 | 0.46   |      | 0.41 |       |
| Very much feared   | 0.42   |      | 0.42 |       |
| Hard to understand to those exposed                              |        | 0.75 |      |       |
| Little known by science  |        | 0.70 |      |       |
| New risk   |        | 0.70 |      |       |
| Involuntary  |        | 0.39 |      |       |
| Results from “unnatural” activity                                |        |      | 0.94 |       |
| Human interference with order of nature                          |        |      | 0.84 |       |
| Results from activity contrary to nature                         |        |      | 0.80 |       |
| Results from human arrogance                                     |        |      | 0.80 |       |
| Illustrates how disasters can follow if we interfere with nature |        |      | 0.79 |       |
| Likely to have effects undetectable to human senses              |        |      | 0.58 |       |
| Unfair and immoral   |        |      | 0.54 |       |
| Hard to avoid  |        |      |      | -0.66 |

Note: Loadings in the interval -0.39 to +0.39 deleted.

is very marginal and only loaded on two items. The other three factors are quite clear, however:

- Dreaded risk.
- New risk.
- Tampering with nature.

The first and the third factors were correlated at a rather high level, in the case of climate change  $r = 0.77$ . The tampering with nature factor is of particular interest in the present context since its contents appear to be related to the beliefs that make up the factors of NA beliefs and superstition. It may be noted that previous work on this factor has been concerned

with nuclear hazards and that the present results extend it to new domains.

### 6.3. Risk Perception Indices

For further analysis, hazards were grouped into three groups:

- Nonnuclear, nonradiation (called nonnuclear in text).
- Radiation, nonnuclear.
- Nuclear.

The grouping was motivated by the frequent finding that radiation and nuclear hazards give rise to different reactions than do many other hazards. There was also a practical reason for the grouping since there was a special interest in the perception of nuclear and radiation risks. However, in the present article, only results from analyzing nuclear risks will be presented. The other two groups of risks gave very similar results.

The risks were all rated by the respondents in four aspects:

- Personal risk.
- General risk.
- Seriousness.
- Demand for risk mitigation.

Hence four indices were constructed and used in further analyses.

### 6.4. NA Beliefs and Other Variables

Table IV gives correlations between the six NA dimensions and the three risk characteristics of climate change, nuclear waste, and genetic engineering, respectively.

It is clear from the table that only higher consciousness beliefs and denial of analytic knowledge had consistent and at least moderately strong relations with the ratings of the three specific risks.

The six NA dimensions were also correlated with background data, personality, and trust (see Table V).

Correlations with gender were weak, but women tended to have higher scores in the NA belief dimensions. Educational level was negatively related to NA beliefs. Religious orientation dimensions were positively related to NA beliefs and fairly strongly. Trust variables showed consistent negative relations

**Table IV.** Correlations Between NA Beliefs, Tampering with Nature, and Traditional Psychometric Dimensions

|                                   | Higher<br>Consciousness<br>Beliefs | Denial of<br>Analytic<br>Knowledge | Belief in<br>the Reality<br>of the Soul | Traditional<br>Superstition | Belief in<br>Paranormal<br>Phenomena | Alternative<br>Healing |
|-----------------------------------|------------------------------------|------------------------------------|---|-----------------------------|--------------------------------------|------------------------|
| Tamp. nature, climate change      | 0.31**                             | 0.42**                             | 0.19*                                   | 0.13                        | 0.25**                               | 0.06                   |
| Tamp. nature, nuclear waste       | 0.27**                             | 0.41**                             | 0.18*                                   | 0.12                        | 0.10                                 | -0.02                  |
| Tamp. nature, genetic engineering | 0.33**                             | 0.40**                             | 0.18*                                   | 0.07                        | 0.17*                                | -0.08                  |
| Dreaded risk, climate change      | 0.34**                             | 0.34**                             | 0.17*                                   | 0.17*                       | 0.27**                               | 0.21*                  |
| Dreaded risk, nuclear waste       | 0.36**                             | 0.35**                             | 0.24**                                  | 0.12                        | 0.13                                 | 0.05                   |
| Dreaded risk, genetic engineering | 0.38**                             | 0.33**                             | 0.17*                                   | 0.10                        | 0.16*                                | -0.01                  |
| New risk, climate change          | 0.15                               | 0.29**                             | 0.04                                    | 0.11                        | 0.00                                 | -0.09                  |
| New risk, nuclear waste           | 0.17*                              | 0.25**                             | 0.02                                    | 0.04                        | 0.12                                 | -0.09                  |
| New risk, genetic engineering     | 0.04                               | 0.18*                              | -0.01                                   | -0.11                       | 0.11                                 | -0.13                  |

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

to NA variables. Paranoid and schizoid thought patterns were positively related to NA dimensions.

### 6.5. Correlations with Risk Perception

The six NA dimensions were correlated with the risk indices (see Table VI). The table does not give the results for general risk, since they were quite similar to those with personal risk. It is clear from the table that the dimension having the strongest correlations with risk variables was that of higher consciousness beliefs. Checks on these correlations for spurious effects of the background variables gender, age, and educational level showed that the correlations were virtually unchanged when these variables were partialled out.

Table VI also gives the correlations between trust dimensions and risk perception indices. The most consistent relationship is found for trust in corporations, in agreement with a previous result (Sjöberg, 1999). It is particularly interesting that trust in politicians displays the weakest correlations with perceived risk. The level of these correlations indicates that trust explains only some 5% of the variance in perceived risk in the present data.

As to personality and religiousness, Table VI gives correlations with risk variables.

Only neuroticism and religious quest had consistent correlations with risk perception data, and these were moderately strong. The general picture from these correlations is that mostly the NA dimensions, especially higher consciousness beliefs, showed some

**Table V.** Correlations Between NA Beliefs, Background Data, Personality, and Trust

|                                 | Higher<br>Consciousness<br>Beliefs | Denial of<br>Analytic<br>Knowledge | Belief in<br>the Reality<br>of the Soul | Traditional<br>Superstition | Belief in<br>Paranormal<br>Phenomena | Alternative<br>Healing |
|---------------------------------|------------------------------------|------------------------------------|---|-----------------------------|--------------------------------------|------------------------|
| Gender                          | 0.18*                              | 0.10                               | 0.14                                    | 0.11                        | 0.08                                 | 0.05                   |
| Age                             | 0.13                               | -0.07                              | -0.12                                   | -0.08                       | -0.08                                | -0.13                  |
| Educational level               | -0.22*                             | -0.44**                            | -0.05                                   | -0.13                       | -0.05                                | 0.13                   |
| Psychoticism                    | -0.19*                             | 0.02                               | -0.10                                   | -0.05                       | 0.00                                 | 0.08                   |
| Extraversion                    | 0.07                               | -0.05                              | 0.07                                    | -0.02                       | -0.02                                | 0.09                   |
| Neuroticism                     | 0.14                               | 0.15                               | 0.16                                    | 0.22**                      | 0.08                                 | 0.02                   |
| Religious quest                 | 0.51**                             | 0.18*                              | 0.27**                                  | 0.22**                      | -0.04                                | 0.03                   |
| Extrinsic religious orientation | 0.24**                             | 0.09                               | 0.20*                                   | 0.08                        | 0.07                                 | -0.01                  |
| Intrinsic religious orientation | 0.51**                             | 0.12                               | 0.26**                                  | 0.12                        | -0.11                                | 0.00                   |
| Trust in industry               | -0.22**                            | -0.38**                            | -0.23**                                 | -0.33**                     | -0.24**                              | 0.01                   |
| Trust in general honesty        | -0.12                              | -0.21**                            | -0.14                                   | -0.25**                     | -0.20*                               | -0.07                  |
| Trust in politicians            | 0.00                               | -0.16                              | -0.11                                   | -0.13                       | -0.16                                | -0.01                  |
| Belief in social harmony        | -0.09                              | -0.06                              | -0.22**                                 | -0.11                       | -0.18*                               | -0.02                  |
| Paranoid thought patterns       | 0.22**                             | 0.25**                             | 0.24**                                  | 0.21*                       | 0.08                                 | -0.07                  |
| Schizoid thought patterns       | 0.14                               | 0.19*                              | 0.27**                                  | 0.28**                      | 0.16                                 | 0.19*                  |

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Table VI.** Correlations Between Risk Perception of Nuclear Risks, NA Beliefs, Trust, Religious Involvement, and Personality

|                                 | Perceived Level of Risk | Seriousness of Risk | Demand for Risk Mitigation |
|---------------------------------|-------------------------|---------------------|----------------------------|
| Higher consciousness beliefs    | 0.34***                 | 0.34***             | 0.23**                     |
| Denial of analytical knowledge  | 0.25**                  | 0.25**              | 0.17*                      |
| Belief in reality of the soul   | 0.17*                   | 0.22**              | 0.10                       |
| Traditional superstition        | 0.15                    | 0.11                | 0.08                       |
| Alternative healing practice    | 0.14                    | 0.11                | 0.18*                      |
| Belief in paranormal phenomena  | 0.22**                  | 0.18*               | 0.21*                      |
| Trust in industry               | -0.32***                | -0.14               | -0.14                      |
| Trust in general honesty        | -0.30***                | -0.11               | 0.08                       |
| Trust in politicians            | -0.16                   | -0.03               | 0.09                       |
| Belief in social harmony        | -0.23**                 | -0.13               | -0.01                      |
| Psychoticism                    | -0.05                   | -0.06               | -0.06                      |
| Extraversion                    | -0.03                   | 0.04                | 0.01                       |
| Neuroticism                     | 0.23**                  | 0.12                | 0.03                       |
| Paranoiac thought patterns      | 0.10                    | -0.01               | -0.03                      |
| Schizoid thought patterns       | 0.11                    | 0.05                | -0.03                      |
| Religious quest                 | 0.28***                 | 0.15                | 0.03                       |
| Extrinsic religious orientation | 0.04                    | -0.05               | 0.09                       |
| Intrinsic religious orientation | 0.21*                   | 0.18*               | 0.07                       |

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

promise in explaining risk perception. These relationships are next studied in more detail in a series of regression analyses.

### 6.6. Regression Models

The six NA dimensions were entered into regression models to explain variation in the risk perception indices. Results are given Table VII.

Table VII shows that NA belief dimensions accounted for about 15% of the variance of perceived risk as measured in the 12 indices, lower for seriousness of risk and demand for risk mitigation. It is also seen that by far the most powerful NA dimension is what we have called higher consciousness beliefs and that belief in paranormal phenomena was the second most powerful. The behavioral variable measuring use of alternative healing had almost no power in accounting for risk perception.

The demand for risk mitigation was harder to account for than straightforward risk perception. This is

**Table VII.** Results from Regression Analyses of Nuclear Risk Variables with NA Type of Variables as Predictors,  $\beta$  Values (Standardized Regression Coefficients)

| Explanatory Variables          | Perceived Level of Risk | Seriousness of Risk | Demand for Risk Mitigation |
|--------------------------------|-------------------------|---------------------|----------------------------|
| Higher consciousness beliefs   | 0.251*                  | 0.355***            | 0.251*                     |
| Denial of analytical knowledge | 0.107                   | 0.046               | 0.074                      |
| Belief in reality of the soul  | -0.173                  | -0.034              | -0.102                     |
| Traditional superstition       | 0.167                   | -0.035              | -0.007                     |
| Belief in paranormal phenomena | 0.116                   | 0.093               | 0.132                      |
| Alternative healing practice   | 0.091                   | 0.117               | 0.124                      |
| $R^2_{adj}$                    | 0.133                   | 0.131               | 0.066                      |

a common finding in attempts to model that type of policy-oriented attitude (Sjöberg *et al.*, 2000).

## 7. DISCUSSION

Four NA dimensions were identified in the present study, as well as the tampering with nature factor in the extended psychometric model. The multidimensional nature of NA and related beliefs has also been documented in recent work by Lange, Irwin, and Houran (2000).

The most important background variable was education. People with a higher level of education were found to be less impressed by NA messages. Hence, the bias in our sample implies that the population at large is more inclined to accept NA beliefs than were the respondents.

Women were only slightly more attracted to NA than men. Religious commitment was positively related to NA beliefs, and so were psychotic thought patterns and lack of trust. It was of particular interest to note the positive relationship between NA beliefs and commitment to traditional religion, since it would have been reasonable to find the opposite; NA beliefs are hardly compatible with a traditional religious perspective. The relation between NA dimensions and perceived risk was positive, as expected, and strongest for higher consciousness beliefs with denial of analytic thought second in importance. Trust in corporations correlated negatively, as expected, with perceived risk, while other trust measures had small or zero correlations with perceived risk. Neuroticism and religious quest had consistent (positive) correlations with level of perceived risk.

Multiple regression analyses showed that NA belief dimensions accounted for about 15% of the variance of perceived risk (see Table VII), lower for seriousness of risk and demand for risk mitigation. Higher consciousness beliefs was the most important explanatory factor. Belief in paranormal phenomena was the second most important factor.

Of course, the present correlational results do not prove that NA beliefs have a causal relationship with risk perception, but they are consistent with such a relationship, as hypothesized. Alternative explanations in terms of background factors being related to both NA beliefs and risk perception were not supported by the data in analyses carried out to check this possibility. Another possibility—that perceived risk causes people to embrace NA beliefs—is logically possible but seems psychologically farfetched.

These results are counter to the claims made by Frisk that NA beliefs are embraced in particular by well-educated people (Frisk, 1993, 1996). Also, Frisk claims that healing is a central component of the NA syndrome. However, no strong relationship between healing practices and NA beliefs was found here. It seems that people who are members of organized groups focusing on NA beliefs and practices may have a high level of education, even though such beliefs are negatively related to education in the general population. Different belief dynamics of people with high and low involvement were also documented by McGarry and Newberry (1981) in their study of beliefs in paranormal phenomena.

In further work on risk perception models it would be interesting to distinguish between three levels of individual determinants of risk perception:

1. Semantically related, but not overlapping, surface factors, such as attitude to the risk generating technology.
2. Semantically unrelated surface factors, such as the NA beliefs studied here.
3. Personality.

Research carried out so far has shown that some factors of item 1 above have quite powerful explanatory value, while it has been hard to find equally potent factors of items 2 and 3 (see Sjöberg, in press-b for current work where some effects of this type are found, but weak or moderately strong at most). In Sjöberg (in press-b), other item 2 factors, such as worldviews, are also related to risk perception data and their effects are compared to those of NA beliefs.

In conclusion, this article has documented a moderately strong relationship between NA beliefs and

risk perception. Since the NA movement has developed and grown in parallel with technology opposition and worries about technology risks, and since the movement espouses many beliefs alien or even hostile to science and technology, it seems reasonable to conclude that New Age beliefs may be an important component in modern risk discourse.

## APPENDIX

### Items Measuring the Four NA Beliefs Factors, Paranormal Beliefs, and the Use of Alternative Therapies

#### *Higher consciousness factor (alpha 0.82)*

1. The task of man is to attain a higher state of consciousness
2. If you search for your inner being you will live in the light
3. Humanity is developing a higher consciousness
4. You must be aware of and work with your body's energy flows
5. We all have a spark of divinity inside us
6. If you have the right thoughts they will make the world positive, to conform to your desires
7. You get true knowledge by turning inward, towards yourself
- \*8. The soul continues to exist though the body may die
9. There is a meaning in all that happens
10. We all have a pre-determined fate
11. You should trust your intuition above all else
12. We are facing a new era: the Age of Aquarius

#### *Reality of the soul factor (alpha 0.97)*

- \*1. During altered states, such as sleep or trances, the spirit can leave the body
2. Ghosts exist
- \*3. Reincarnation does occur
- \*4. Astrology is a way to accurately predict the future
- \*5. Some psychics can accurately predict the future
6. There are clairvoyants who can "see" what is happening in another place
- \*7. Witches do exist
- \*8. Your mind or soul can leave your body and travel (astral projection)
- \*9. The abominable snowman of Tibet exists

\* Items are from Tobacyk's Revised Paranormal Scale.

10. There are spiritual beings who communicate with certain chosen people
- \*11. The horoscope accurately tells a person's future
12. Gods have visited earth in ancient times; they were beings from other planets
- \*13. Some people have an unexplained ability to predict the future
- \*14. There is a devil
- \*15. Black magic really exists
- \*16. The Loch Ness monster of Scotland exists
17. Tarot cards reveal the hidden connections in the cosmos
18. Extra-sensory transmission of thoughts is possible
19. Crystals can cure diseases
20. Flying saucers and similar vessels from other planets do exist
21. You can feel intuitively when something important is about to happen
22. Some people have been abducted by aliens from outer space
23. Angels exist
24. People are reborn and learn something new in each life
25. People's destinies are dependent on the planets
- \*26. There is a heaven and a hell
27. Plants have souls
28. All living things are surrounded by an aura

*Folk superstition factor (alpha 0.92)*

- \*1. If you break a mirror, you will have bad luck
- \*2. The number thirteen is unlucky
- \*3. Black cats can bring bad luck
4. It is unlucky to put your keys on the table
5. It is unlucky to spill salt
6. It is unlucky to walk under a ladder

*Denial of analytic knowledge factor (alpha 0.83)*

1. It doesn't pay to try to plan your life, you have to trust your feelings instead
2. Scientists have often been forced to recant their denial of the existence of paranormal forces
3. You learn more from personal experience than from books
4. You should believe more of what you see with your own eyes than what the "experts" say

5. Because of science, materialism and the industrial society, humankind has lost its insight about the unbroken unity of the cosmos
6. Too much knowledge prevents a creative way of working
7. Eastern wisdom is much more profound than Western science and technology
8. Children and primitive people untouched by "civilization" understand much better what is important in life
9. If people used their feelings instead of reason, the world would be a much better place

*Paranormal beliefs (alpha 0.81)*

Degree of belief in the following phenomena was rated:

- Accidents in the Bermuda triangle
- Circles in crops
- "The hundredth ape"
- Taped voices of spirits
- Uri Geller's magical powers
- Earth radiation
- Walking on glowing coals
- Pyramid force
- Spiritistic seances

*Alternative healing methods (alpha 0.93)*

The respondents were asked to state how often they had used the methods below.

- Homeopathy
- Crystal healing
- Acupuncture
- Psychic surgery
- Yoga
- Rosen therapy
- Aura-soma therapy
- Color therapy
- Qigong
- Auriculo therapy
- Aroma therapy
- Ayurveda therapy
- Flower therapy
- Meditation
- Chakra balancing
- Liberating breathing
- Kinesiology
- Bioenergetics
- Feldenkreis method
- Alexander therapy
- Body harmony
- Roling

\* Items are from Tobacyk's Revised Paranormal Scale.

- Reiki
- Reincarnation therapy
- Healing
- Visualization
- Affirmations
- Shamanism
- Balancing of body chemistry

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