Perceptions of Hospital Safety Records: Mean Or Variance?

Barbara Kahn, University of Pennsylvania, USA
Janice Jung, University of Pennsylvania, USA

Consumers’ hospital choice is influenced by framing effects (mortality versus survival rates), and by how data are presented (animated pictographs versus boxplots). In a mortality framing, high variance hospitals are less likely to be chosen when their safety records are illustrated by animated pictographs than boxplots.

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Paper #1: Motivated Hypochondriacs: Disease Labels Shape Health Perceptions
Chiara Longoni, New York University, USA
Geeta Menon, New York University, USA

Paper #2: Sleeping with One is Sleeping with Many: How Shifts in the Salience of Others’ Behavior can Improve Contagious Disease Prevention
Adriana Samper, Arizona State University, USA
Mary Frances Luce, Duke University, USA
Debu Purohit, Duke University, USA

Dengfeng Yan, University of Texas at San Antonio, USA
Huachao Gao, University of Texas at San Antonio, USA

Paper #4: Perceptions of Hospital Safety Records: Mean or Variance?
Janice Yeonjin Jung, University of Pennsylvania, USA
Barbara Kahn, University of Pennsylvania, USA

SESSION OVERVIEW
In an era of direct-to-consumer advertising, widespread Internet-based health information, and heavy reliance on self-care, consumers must take multiple steps in navigating their way toward optimal health decisions. A typical consumer investigates disease and symptom information, processes different types of health appeals, and purchases various preventive health goods. Further, if a disease becomes more serious, consumers must even make decisions regarding different types of health providers. As such, this high-stakes domain involves multiple factors that may influence each decision making stage.

Together, the papers in this special session examine four critical factors (categorization, fit with a health message, ownership, and hospital record framing) that play a role in hindering or fostering important health-related decisions such as health and risk assessment, prevention of diseases, and choice of health provider. Understanding these factors is at the root of helping consumers make normatively appropriate decisions regarding their health.

The first paper by Longoni and Menon examines the interplay of categorization-based biases and self-protection motives on health perceptions. Four studies illustrate that the mere presence (vs. absence) of a one-word label biases symptom reporting, perceived symptom intensity, and overall health risk assessment. However, decreased defensiveness when processing health information eliminates such bias.

Building on this theme of considering the role of small changes to health information in shaping health decision making, the second paper by Samper, Luce, and Purohit presents a strategy to assist consumers in overcoming feelings of low control over one’s health outcomes, a typical barrier in disease prevention. Fostering a match between the focus of a health message (self vs. other-focus) and consumers’ worldviews of control (high vs. low) is associated with greater preventive behaviors.

Moving along the decision making chain to examining purchase of preventive goods, Yan and Gao examine how owning a preventive good can influence risk estimates. These studies show that merely owning a preventive product (e.g., an anti-cavity toothpaste) leads consumers to estimate the associated risk as more likely and more harmful.

Finally, the fourth paper by Jung and Kahn explores the factors that affect consumer choice of health providers. Hospital choice is influenced by data on hospital safety records, both in terms of framing (whether the hospital is categorized by mortality or survival rates), and illustration format (whether the data are animated pictographs or boxplots).

Overall, this special session illuminates key aspects of how consumers make decisions about their health, providing theoretical insights and practical applications to improve consumer decision-making in this domain. Together, these papers raise and answer interesting questions such as: What factors contribute to forming health perceptions and how can we aid accurate risk assessment? What kind of health information is best suited to engage different consumer segments? How can policy makers ensure that the right information is presented in the right way? We expect this special session to attract a wide ACR audience, in particular consumer researchers in risk assessment, health, context effects, attitudes and intentions.

Motivated Hypochondriacs: Disease Labels Shape Health Perception

EXTENDED ABSTRACT
This research looks at how disease labels might fundamentally alter health perceptions. We propose that disease labels, much like categories, lack precise and discrete membership boundaries: for a stimulus (i.e., a constellation of somatic and affective sensations at a certain point in time) to be assigned to a category (i.e., a certain illness), not all features (i.e., symptoms) need be present. In other words, symptom matching, much like feature matching, should be a flexible process of interpretation rather than exact matching. This results in a certain degree of latitude when attending to, remembering, and attributing somatic and affective states, giving rise to biases in symptom reporting and thereby affecting health perceptions. Furthermore, such disease labeling effect is susceptible to self-serving biases, whereby inaccuracies in risk estimates reflect the interaction of categorization-based errors with defensive mechanisms.

In a series of four studies, we show the following: (a) Disease labels alter symptom reporting and bias health risk estimates; (b) The direction of this bias reflects a self-protection motive: a label signaling (or interpreted as signaling) a mild ailment leads to greater symptom reporting and higher risk estimates compared to a label signaling (or interpreted as signaling) a severe ailment; (c) Reducing defensiveness eliminates this bias; (d) Perceived disease threat partially mediates the effect; (e) Disease labels do not affect risk estimates made for the general population (i.e., base-rates) or for individuals matched for age and gender (further corroborating the motivational nature of the bias); and (f) This bias holds when controlling for incidental affect, well-being, life satisfaction, and general health perception.

In Study 1, participants were handed a survey ostensibly assessing the wellness of the university community. Although all versions of the survey described the same medical condition,
the disease was labeled as Seasonality, Mild Seasonality, Severe Seasonality, or was not labeled. Participants were asked to report (a) if in the previous month they had experienced any symptoms of the disease, and if so which ones, (b) how intensely they had experienced these symptoms, and (c) risk estimates (i.e., likelihood of self-diagnosis and likelihood of contraction) for self and for another person matched for age and gender. As expected, the presence (vs. absence) of a label was associated with higher symptom recognition, higher perceived symptom intensity, and greater risk estimates. Perceived disease severity moderated the effect: symptom reporting, symptom intensity, and risk estimates were higher if the label signaled (or was interpreted as signaling) a mild (vs. severe) ailment (as measured by perceived severity ratings). Finally, labels affected risk estimates for the self but not for others. These effects held when controlling for incidental affect, well-being, life satisfaction, and general health perceptions.

In Study 2 and 3 we sought to better understand the phenomenon and identify boundary conditions. We hypothesized that the biasing effect of disease labels on health perception is due to defensive motives. If so, the effect should disappear when defensiveness is reduced, either because the person affirms alternative self-resources (Study 2), or because one’s sense of perceived control is temporarily shaken (Study 3).

Building on self-affirmation theory (Steele, 1988) and on the role of self-affirmation in reducing perceived invulnerability to health risks (e.g., Sherman, Nelson and Steele 2000), in Study 2 participants were first either allowed to affirm themselves in an important domain or they were not allowed to do so. Participants were then handed a survey on the wellness of the university community containing a description of a medical condition that was either labeled or not labeled. To measure risk estimates, participants rated the likelihood they, as well as an average person of their same age and gender, would contract the disease. As predicted, defensiveness moderated the effect of labels on risk estimates, with the direction of the bias determined by participants’ perception of disease severity. When participants did not engage in self-affirmation, risk estimates were biased by the presence of a label. However, when participants’ defensiveness was reduced (because they engaged in self-affirmation), risk estimates were no longer biased by the presence of a label. Neither self-affirmation nor label affected risk estimates for another person, further corroborating the notion that the phenomenon reflects a self-protection bias.

Study 3 builds on research showing how high perceived control is associated with greater defensiveness and perceptions of invulnerability to negative events (e.g., DeJoy 1989; Harris 1996; Hoorens and Buunk 1993). We reasoned that we could reduce defensiveness and eliminate the biasing effect of labels by inducing perceptions of low control. Participants were first asked to recall and vividly describe an instance in which they felt they had high (vs. low) control, and then handed the same health survey used in Study 2, which contained the label (vs. no label) manipulation and the critical measures of risk. As expected, risk estimates of low-control participants were not biased by the presence of a label, presumably because the induction of low control tempered defensiveness; risk estimates were instead biased by the presence of a label when participants recalled an instance of high perceived control. The direction of the bias was once again determined by participants’ perception of disease severity, and the effect did not apply to risk estimates for others.

Study 4 brings together the previous three studies to gain a better understanding of the process behind the phenomenon. We first manipulated the factor self-affirmation as in Study 2, and then manipulated the factor label. The wellness survey contained measures of risk estimates and an expanded web of measures of perceived disease threat. Bootstrapping analyses revealed that perceived disease threat partially mediated the relationship between label and risk estimates, and defensiveness moderated the relationship between perceived disease threat and risk estimates.

This research is important from both a theoretical and applied perspective. Theoretically, this research elaborates on how health perceptions are formed, and presents a novel effect based on the interplay of categorization and defensive processes. From an applied perspective, this research has substantive implications for social welfare, as both preventive and care-seeking behaviors heavily rely on self-assessment.

**Sleeping with One is Sleeping with Many: How Shifts in the Salience of Others’ Behavior can Improve Contagious Disease Prevention**

EXTENDED ABSTRACT

Low perceived control over one’s health outcomes, or external Health Locus of Control (HLOC) (Wallston et al. 1976a), is associated with poorer health behaviors and outcomes, such as reduced interest in health information (Quadrel and Lau 1989) or prevention behaviors (Morril et al. 1996). While people with more internal HLOC feel they have high control over their health, more external individuals believe that their health outcomes are a result of outside factors such as chance, God, or external authorities, and as such, feel less compelled to perform adaptive health behaviors.

Though the belief that others determine one’s health is often detrimental, it may be positively leveraged when external others do, in fact, impact health outcomes. In this research, we argue that contagious disease offers such a context, and show that manipulating the focus of a health appeal to match individual worldviews of control over health can improve persuasion. Specifically, we find that individuals who feel high control over their health (health internals) increase their prevention intentions with self-focused messages, while individuals who feel less control over their health (health externals) increase these intentions with other-focused messages. We suggest that this is driven by a beneficial effect of compatibility: a self-focused message emphasizes personal control, which is easier to process for health internals, while an other-focused message emphasizes a lack of control, which is easier to process for health externals. Importantly, this is only true with contagious diseases; with noncontagious disease, this compatibility effect disappears as others have a much weaker role in the likelihood that one will be affected by disease.

In Study 1, we manipulated the message recipient’s processing focus with mortality salience and control (dental pain) primes. The reminder of one’s mortality has been shown to lead to an avoidance of self-focus (Arndt et al. 1998), and is often elicited in medical contexts (e.g., physician’s offices, clinics, etc.). Participants in this 2 (prime: mortality salience vs. control) x HLOC (measured) experiment completed the HLOC scale (Wallston et al. 1976a) and were primed with mortality salience or dental pain. They then read a passage about HIV and rated their intentions to engage in future HIV prevention. Results revealed a significant prime x HLOC interaction: under the self-focused control prime, more internal HLOC increased intentions to engage in HIV prevention, while under the other-focused mortality prime, more external HLOC marginally increased intentions to engage in HIV prevention. Thus, we see compatibility between internal beliefs and self-focus and external beliefs and other-focus.
In Study 2, we directly examined the role of self vs. other focus in a 2 (referent: self vs. other) x HLOC (measured) experiment. Participants completed the HLOC measure and read information on HIV. Prior to reading this information, participants were asked to think about how HIV affected them (self-focused condition) or how it affected the average individual (other-focused condition). We chose this “average individual” perspective to ensure that participants focused on an anonymous individual that was neither close nor individuated (Raghubir and Menon 1998). We again took measures of disease prevention as well as message processability measures of ease of understanding. Results revealed a significant referent x HLOC interaction, such that health internals were more likely to engage in vigilance behaviors under self-focus, while health externals were more likely to engage in vigilance behaviors under other-focus, replicating Study 1. Examination of message processability also revealed a significant interaction. A bootstrapping mediation analysis revealed that message processability mediated the effects of HLOC on HIV prevention.

In Study 3, to further generalize these effects, we manipulated instead of measured HLOC, extended to a new disease context and used a public service ad to manipulate the referent. We used the threat of MERS (Middle East Respiratory Syndrome), an airborne disease that had broken out in Saudi Arabia and spread to European countries by plane. In this 2 (HLOC: internal vs. external) x 2 (referent: self vs. other) experiment, we manipulated HLOC by having participants read a passage about the controllable (internal) vs. uncontrollable (external) risks of air travel and then showed a MERS public service ad that emphasized the risk of MERS for either the self or the average person. After viewing the ad, participants rated their likelihood of engaging in air travel disease prevention behaviors (e.g., judiciously using hand sanitizer, wearing a face mask). Results revealed a significant HLOC x referent interaction on prevention whereby as before, under self focus, the internal control prime lead to increased prevention while under other focus, the external control prime did so.

Study 4 examined whether the positive effect observed with other-referencing for health externals was limited to contagious disease contexts. We only examined other (average individual) focus and manipulated contagion by presenting female participants with information about obesity described as contagious or noncontagious. This resulted in a 2 (contagion: contagious vs. noncontagious, manipulated) x 2 (Health Locus of Control: internal vs. external) design. HLOC was manipulated through a passage emphasizing the role of healthy living (internal, high control) vs. genetic factors (external, low control) in determining one’s health outcomes. Analyses revealed a significant contagion x HLOC interaction on prevention. As in Study 2, when obesity was described as contagious with an other-focus, external HLOC increased disease vigilance. However, when obesity was described as noncontagious with this other-focus, external HLOC was no longer beneficial. These results replicate prior external control /other-focus compatibility effects with contagious disease, yet show that these effects do not hold when a disease is noncontagious.

In sum, we show that message compatibility effects exist between perceived control over health and the message referent to improve disease prevention. In demonstrating this, we identify a way to overcome the obstacle of external/low control individuals disengaging from their health. We also show that the benefits of message compatibility can be achieved with the subtle manipulation of other-focus in a contagious disease context and suggest that this is driven by ease of processing.

**Having More But Not Feeling Better: The Effects of Merely Owning Preventive Goods on Risk Perceptions**

**EXTENDED ABSTRACT**

Earlier literature has demonstrated the mere ownership effect where individuals evaluate an object more favorably after owning it (Beggan and Allison 1997). In some instances people acquire the products intentionally, whereas the effect is more intriguing in other circumstances where the ownership is arbitrary such as being induced by random assignment in an experiment. This mere ownership effect is often interpreted as a consequence of motivated reasoning (Festinger 1957; Kunda 1990; McGuire and McGuire 1991; Thaler 1980).

Research on mere ownership effect has been exclusively focused on the effects of mere ownership on product-related consequences such as evaluation (Beggan 1992; Strahilevitz and Loewenstein 1998), choice (Sen and Johnson 1997), pricing (Kahneman et al. 1990; Thaler 1980), and so forth. These findings could be summarized as “sweet lemon” effects. The current research, however, shifts the attention away from the lemon itself to explore whether merely owning preventive goods can influence people’s risk perceptions. Preventive goods here refer to products that prevent negative outcomes from happening or reduce financial, psychological, and other loss when these events happen. Examples include sun screen, anticavity toothpaste, and insurance.

The core hypothesis of this research is that owning a preventive product leads individuals to judge the associated risk as more likely and more harmful. We propose that this effect is driven by two motivations. First, individuals want to maximize the value of their possessions. For preventive goods, their value won’t be realized until negative events happen. The more frequently the associated negative event occurs, the greater value the product will have. For example, an umbrella will be more valuable if it rains frequently than infrequently. The second motive underlying our prediction is that people often have a desire to be better than others (Dunning, Perie, and Story 1991; Krueger and Mueller 2002; Kunda 1987). In the present context, such self-enhancing tendency will lead the owner of preventive goods to perceive the negative events as more likely because it will create more opportunity for owners to be better than non-owners. In addition, the superiority will become more salient if the negative event is very negative.

Four studies were conducted to examine our prediction using a variety of product categories including anticavity gum (Study 1), Apple Care (Study 2A), sun screen (Study 2B), and an advanced anti-theft lock (Study 2C). In Study 1, 137 undergraduates were randomly assigned to four conditions. Participants in the ownership (control) condition were told that they own a pack of anticavity gum (nothing). In addition to these two conditions, two more groups were included to rule out alternative explanations. First, it’s possible that being merely exposed to information about preventive goods is sufficient to increase risk perceptions by making the risk concept more accessible (Raghubir and Menon 1998; Schwarz et al. 1991). Thus, we included an information condition in which participants were only provided with information about the preventive product. Second, it’s arguable that receiving any gift may have the same effect. To control for this possibility, we added a gift condition in which participants owned a pack of whitening gum. All participants then were asked to estimate the percentage of American adults having cavity problems from “0” to “100” and to rate the harmfulness of cavity (1 = not harmful at all; 7 = extremely harmful).

The one-way ANOVA on perceived cavity pervasiveness revealed a marginally significant difference among conditions.
(F(3, 133) = 2.56, p = .06). Follow-up contrast analyses indicated that, consistent with our theorizing, participants in the \textit{ownership condition} (M = 69.93, SD = 10.61) rated cavities as more common than those in the \textit{gift condition} (M = 61.16, SD = 14.75; t(133) = 2.10, p < .05), \textit{information condition} (M = 59.70, SD = 21.57; t(133) = 2.53, p < .05), and \textit{control condition} (M = 61.13, SD = 15.74; t(133) = 2.19, p < .05). No difference was found among the latter three conditions (ps > .70). The analysis on the harmfulness of cavity revealed a parallel pattern. Follow-up analyses for the significant main effect (F(3, 133) = 3.94, p < .01) indicated that participants who received a pack of anticavity gum (M = 5.90, SD = 1.09) rated cavity as more harmful than their counterparts in the \textit{gift condition} (M = 4.97, SD = 1.18; t(133) = 2.81, p < .01), \textit{information condition} (M = 5.05, SD = 1.60; t(133) = 2.64, p < .01), and \textit{control condition} (M = 4.92, SD = 1.24; t(133) = 3.07, p < .01). No difference was found among the latter three conditions (ps > .65). In Studies 2A, 2B, and 2C, we replicated the above results using different product categories. The convergent support obtained from all these studies indicated that our findings are robust and generalizable.

Our findings contribute to research on mere ownership by expanding the scope from product-related evaluative judgments to more general, product unrelated perceptions. Our data can partially explain many marketing strategies such as free samples. Interestingly, our findings also suggest that offering free samples may benefit other companies. For example, as shown in Study 1, offering a free pack of anticavity gum led to higher perceptions of cavity risk, which, in turn, may increase consumers’ purchase intention for anticavity products in general such as mouth wash and toothpaste. Future research is needed to directly examine such predictions.

\textbf{Perceptions of Hospital Safety Records: Mean or Variance?}

\textbf{EXTENDED ABSTRACT}

Consumers’ view of hospitals should be guided by informative, accurate, and understandable hospital safety records. We attempt to understand the ways in which safety records of hospitals are processed in consumers’ minds and tackle various barriers to rational choices of hospitals.

Hospitals’ safety records are based on average estimates of the risks associated with surgeries (e.g., cardiovascular operation), and variance produced by the uncertainty in those estimates. Existing literature has shown that the public finds it difficult to process mean and variance simultaneously. Consumers are especially likely to overlook variance due to their lack of understanding and attention. Further, the literature on self-positivity bias and overconfidence predicts that people may have optimistic conceptions of the safety of the hospital (e.g., Taylor and Brown 1988; Harris 1996; Keller et al. 2002; Lin et al. 2003). These tendencies are possible barriers to understanding variance, because even if consumers do register the variance they may \textit{over-estimate} the upside possibilities and therefore regard large variances as a chance to achieve a better outcome rather than a chance of both better and worse outcomes.

Understanding variance is especially critical for hospital selection because it directly affects the survival of patients. Generally, larger hospitals have smaller variances in estimated mean risks and may also be better equipped. Given the importance of variance, we explore how various framing and depictions of the variance affect the choice of hospitals, so that we can develop a more transparent and rational presentation format.

We conducted two surveys (Study 1: N= 239, Study 2: N = 195) using actual hospital records obtained from the 2010 US Census, American Hospital Association (AHA), and other official sources used by Medicare. The data enables us to predict the mean and variance associated with each hospital’s safety for each person’s health condition. We test how participants’ views of safety records (as measured by their choices of hospitals) are influenced by framing effects (whether the safety records are characterized by mortality rates or by survival rates), by their health conditions (currently healthy or ill), and by how the mean and the uncertainty in the estimated mean are illustrated (by animated pictographs or boxplots). Participants make a choice between a pair of hospitals. There are four pairs of hospitals in each study – we varied whether a higher variance hospital has a lower or higher mean risk than the other hospital, and whether the mean or variance was kept the same between the two hospitals.

We hypothesize that variance is more salient when risks are illustrated by animated pictographs rather than boxplots used by Medicare websites. We also hypothesize that framing risks as survival rates trigger wishful thinking: People will seek high variance hospitals when it is an emergency rather than a non-emergency (Study 1), or when survival rates are low rather than high (Study 2), because they process variance as a chance of positive outcomes when the outlook is bad. Mortality rates, however, do not trigger wishful thinking because people’s mindsets are focused on negative outcomes regardless of the level of risks.

In Study 1, we found that high variance hospitals were less likely to be chosen when their safety records were illustrated by animated pictographs than boxplots used by Medicare websites. We also hypothesize that framing risks as survival rates trigger wishful thinking: People will seek high variance hospitals when it is an emergency rather than a non-emergency situation as opposed to a non-emergency situation in the survival (mortality) condition. Furthermore, participants reported more confidence in their decisions and trust in the hospitals overall when the risks were framed as survival rates than mortality rates. This suggests that when risk is depicted by mortality rates, participants are less susceptible to various motivational biases, such as self-positivity bias, unrealistic optimism, and “It cannot happen to me” syndrome.

In Study 2, participants reported that they want to know the variance in the estimate of mean risk. However, the ways in which people incorporated the information about variance in their choices depended on framing effects, illustration methods, and the level of risk. We replicated the result of Study 1 that high variance hospitals were less likely to be chosen under animated pictographs than boxplots in the mortality framing condition. The illustration method did not affect hospital choice in the survival framing. Emphasizing variance by animated pictographs seems to focus people’s attention on variance, and presenting risks as mortality rates seems to highlight the downside possibilities of high variance hospitals. The interaction between graphic illustration (animated pictographs vs boxplots) and framing (mortality vs survival) was significant.

Consistent with our wishful thinking hypothesis, participants were more (less) likely to choose a higher variance hospital in an emergency situation as opposed to a non-emergency situation in the survival (mortality) condition. Furthermore, participants reported more confidence in their decisions and trust in the hospitals overall when the risks were framed as survival rates than mortality rates. This suggests that when risk is depicted by mortality rates, participants are less susceptible to various motivational biases, such as self-positivity bias, unrealistic optimism, and “It cannot happen to me” syndrome.

Our wishful thinking hypothesis was again supported in Study 2 that only manipulated the level of risk unlike Study 1 that manipulated the choice context (emergency or non-emergency). High variance hospitals were more likely to be chosen when the risks framed as survival rates were low (e.g., survival rate of 25%) rather than high (e.g., survival rate of 75%). Variance in survival rates is positively...
perceived when risks were high. The level of risks, however, did not affect choices of high variance hospitals when the same risks were framed as mortality rates, because the variance in mortality rates is always perceived negatively when the consumer mindset is focused on deaths. Such wishful thinking was more pronounced when animated pictographs illustrate the risk because animation emphasizes variance. As found in Study 1, participants were more confident about their choices under survival than mortality framing.

Taken together, these results suggest that consumers can be nudged to a healthier and better choice of hospitals if we understand how consumers process hospital risk records.

REFERENCES


