Presenting Health Information: the Influence of Attribute and Numerical Framing on Health Risk Perception

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We analyze the influence of attribute and numerical framing on health risk perception. In two studies, we show that negative attribute frames increase health risk perception. Numerical framing for high relative frequency and numerical presentation moderates this effect. Health risk perception increases purchase intention.

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EXTENDED ABSTRACT

Health information are able to increase positive changes in health behavior among large populations (Fifes-Schaw and Abraham 2009; Wakefield et al. 2010) due to the relationship between health risk perceptions and behavior intentions (Atkinson et al. 2015; Brewer et al. 2007; Dillard et al. 2012; Heideker and Steul-Fischer 2015; Rudisill 2013).

Scholars seldom analysed the effects of attribute and numerical framing on health risk perception for services like insurances. The use of framing creates differences in health risk perception among consumers (Menon, Raghubir, and Agrawal 2008, p. 996; Melas et al. 2012; Peters, Hart, and Fraenkel (2011). Framing is the presentation of objective equivalent information in semantically different ways (Krishnamurthy, Carter, and Blair 2001). Levin, Schneider, and Gaeth (1998) categorize framing effects in the types of risky choice, goal and attribute framing. Numerical framing is an own framing effect beside theses and refers to changes in the interpretation of numerical information when describing it in different but equal frames (Kwong and Wong 2014).

In our two studies, we examine the effects of attribute framing and numerical framing of periodontitis (study 1) and the effects of attribute framing and numerical presentation of private accidents (study 2) on health risk perception. According to Gigerenzer et al. (2007) and Peters, Hart, and Fraenkel (2011), negative attribute frames increase health risk perception more than positive attribute frames (H1). Janiszewski, Silk, and Cooke (2003) impute fundamental character of any selling proposition to attribute information. Thus, we suggest an increase of purchase intention for the offered health insurance of dental supplement insurance (study 1) and private accident insurance (study 2): The higher the health risk perception, the higher the purchase intention for health insurance (H2). Regarding numerical framing, different studies have examined the advantages of frequencies compared to percentages (Gigerenzer and Edwards 2003; Peters, Hart, and Fraenkel 2011). For technical goods, Koukova and Srivastava (2009) illustrate that attribute and numerical framing of the impact information can influence consumers’ perception and behaviors. We assume adequate results for health risk perception: Negative attribute frames with high relative frequency will increase health risk perception more than negative attribute frames with percentages (H3). Drawing on Stone et al. (2015) who emphasized graphical display of icons to increase perceived risk, we suggest that negative attribute frames with text and a pictograph increase health risk perception more than negative attribute frames with plain text (H4).

A total of 222 participants (61.3% female; mean age = 23.47 years) participated in study 1 with a 2 (attribute frame: negative vs. positive) x 3 (numerical frame: percentage vs. high relative frequency vs. low relative frequency) between-subjects design. In the negative attribute treatments, information was given that 20% (percentual frame), 400 out of 2,000 (high relative frequency frame) or 1 out of 5 (low relative frequency frame) adults have massive periodontitis compared to the positive attribute treatments whereby 80% (percentual frame), 1,600 out of 2,000 (high relative frequency frame) or 4 out of 5 (low relative frequency frame) adults do not have massive periodontitis. An offer for dental supplementary insurance followed with a monthly price of €11.40. Health risk perception was measured using a 10-point scale (1 = no risk to health, 10 = very high risk to health) and purchase intention with a 7-point scale (1 = totally disagree, 7 = totally agree).

Results of study 1 indicate a significant influence of attribute framing (F(1,215)= 40.87, β= 1.99, p= .000) (H1) on health risk perception. There is no direct significant effect of numerical framing (F(2,215)= 1.05, β= 0.56, p= > .05) on health risk perception. The interaction between attribute framing and numerical framing containing low and high frequencies is not significant (F(2,215)= 2.38, β= -0.95, p= .095, η²= .022) as hypothesized in H3. Including the high relative frequencies and percentages in the analysis (n=160), there is a significant interaction between attribute framing and numerical framing (F(1,155)= 5.01, β= -1.47, p= .027, η²= .031) (H3). Health risk perception has highly significant influence on purchase intention for dental supplementary insurance (β= 0.21, t= 5.22, p= .000) (H2).

In study 2, 153 participants (65.40% female, mean age = 23.77 years) participated with a 2 (attribute frame: negative vs. positive) x 2 (numerical presentation: plain text vs. text with pictograph) between-subjects design. In the negative attribute treatment, information was given that 9 out of 100 people are injured through private accidents during leisure time or in the household compared to the positive attribute treatments where 91 out of 100 people are not injured. An offer for private accident insurance followed with a monthly price of €10.89. The same scales were used for participants’ perceived level of health risk perception and purchase intention as in study 1.

The results of study 2 underline the significant influence of attribute framing (F(1,148)= 6.35, β= 1.45, p= .013) (H1) on health risk perception. There is no direct significant effect of numerical presentation (F(1,148)= 0.46, β= 0.92, p= > .05) on health risk perception. The interaction between attribute framing and numerical presentation is significant (F(1,148)= 6.19, β= -1.44, p= .014, η²= .040) as hypothesized in H4. Compared to health information with plain text, information with pictographs increase the effect of negative attribute on health risk perception. Health risk perception has a highly significant influence on purchase intention for private accident insurance (β= 0.15, t= 2.29, p= .024) (H2).

We recommend negative attribute frames for health information to higher health risk perceptions. The use of higher relative frequency in negative attribute frames moderates this effect and increases health risk perception more than percentages (Koukova and Srivastava 2009). We approve the addition of pictographs in health information to higher health risk perception. Further research should replicate these findings for other health risks and should focus on other methods of presenting frequencies to raise health risk perception. These investigations could temper the difficulties of understanding health information because of their presentation and could back the largely theoretical research area of the influence of graphs on risk perception, as mentioned by Lipkus (2007).

REFERENCES


