

# Don't Tell Me What to Think: How Perceived and Suggested Risk Affect Selective Exposure to Health Information

Oliver Wedderhoff, Anita Chasiotis, & Tom Rosman

Leibniz Institute for Psychology Information

The structure of this protocol is based on the template of the OSF's preregistration challenge (<https://cos.io/prereg/>).

## Study Information

### Introduction

The concept of selective exposure to information encompasses various individual approaches to deal with potentially self-threatening information that yield in a biased (in contrast to a balanced) search. These approaches include, on the one hand, selectively searching for information that supports or *confirms* one's opinions, self-image and expectations (Hart et al., 2009; Kunda, 1990; Olson & Stone, 2014; Sherman & Cohen, 2002), and, on the other hand, devaluating, ignoring or downplaying information that *disconfirms* individually held opinions or threatens one's self-image (Ditto & Lopez, 1992; Edwards & Smith, 1996). In the literature, selective exposure to information has also been referred to as 'motivated reasoning' (e.g., Kunda, 1990). This means a specific approach to information seeking which is biased in a way that so called 'defense motives', i.e., motives to protect an intact self-image and fend off any threats to self-integrity (Hart et al., 2009), are ideally served.

In the health context, Knobloch-Westerwick, Johnson, & Westerwick (2013) introduced three motivational processes which may underlie biased information seeking and appraisal, from which two, self-bolstering and self-defending, are of interest in our study. Self-bolstering encompasses the motivation to be reassured that there is no significant threat to one's health and physical integrity ("Everything is alright"). Self-defending motivation promotes discrediting, ignoring and avoiding information which (potentially) implies a threat to one's health and physical wellbeing. For example, fear-appealing information which suggests an increased risk of developing cancer tends to be avoided by smokers (Dijkstra, 2009).

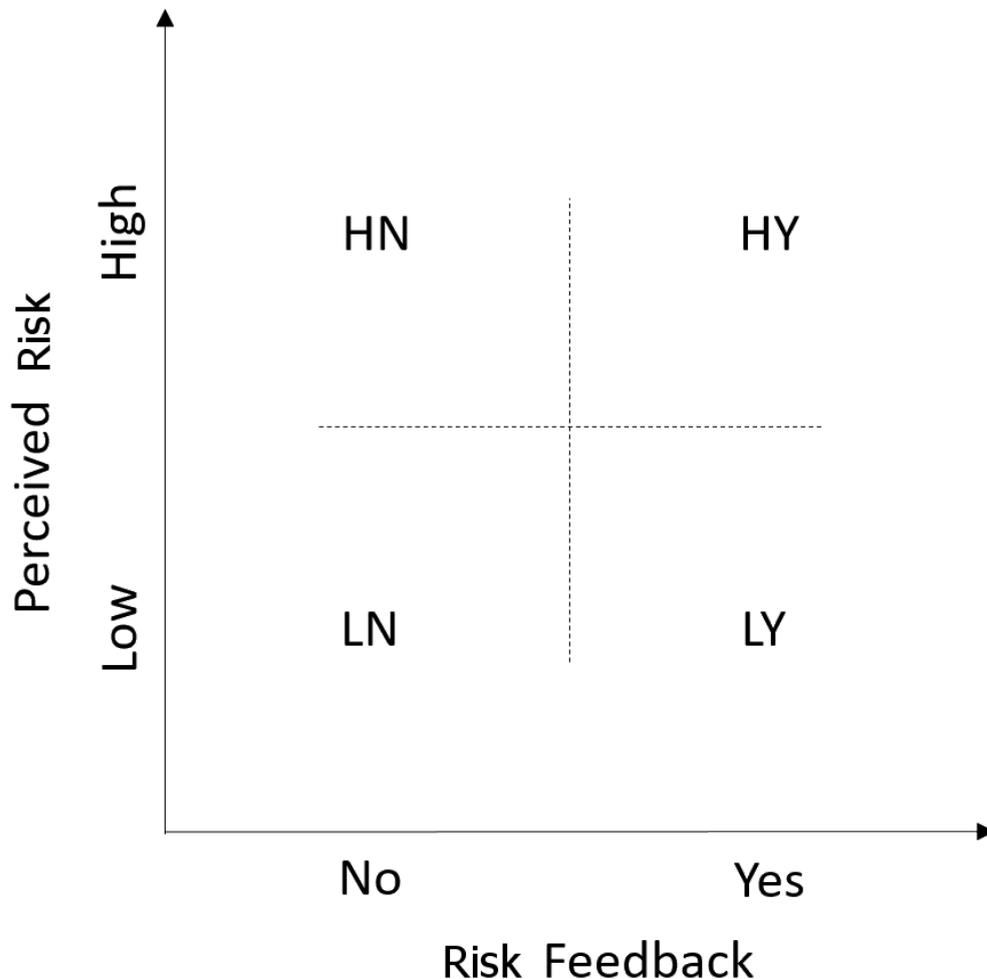
Studies, in which the determining motivational factors of selective exposure to health information are scrutinized, usually have one thing in common: they assume a potential threat originating

from the health information as a precondition for biased information seeking and/or appraisal due to self-bolstering or defending motivations (see van't Riet & Ruiter, 2013, for a review). Perceived risk plays a fundamental role in determining if information might be personally threatening. For example, leaflets suggesting an increased risk for lung cancer in smokers do not imply any potential threat for non-smokers. Thus, threat can be regarded as a necessary precondition for selective exposure to information in health contexts. Therefore, perceived risk for a certain disease should be taken into consideration as a principal basis to appraise health information as threatening or not. In this line of reasoning, the higher the perceived risk, the higher should be the perceived threat and thus, a greater bias in information seeking should occur.

However, risk (and thus, a potential threat) can not only be (internally) perceived, but it can also be (externally) *suggested*, e.g., via feedback about bodily parameters indicating a high or low risk for developing a specific disease. Indeed, our example of a pamphlet advertising smoking cessation ("Smoking increases your risk of developing lung cancer") comprises a suggested (higher) risk for smokers to develop a severe disease. This suggested risk might, on the one hand, match one's perceived risk for developing lung cancer (e.g., a smoker might view himself as having a higher risk for lung cancer). In this case, the information would be threatening *and* confirming. In contrast, another smoker might think that his risk for developing lung cancer is not increased because he does a lot of sports and his smoking ancestors all grew very old. In the latter case, the suggested risk does not match the perceived risk - the information is threatening and disconfirming at the same time. All in all, combining perceived and suggested risk (or risk feedback) leads to four possible combinations in individuals who are confronted with health information: perceived risk (low or high risk) crossed with risk feedback (risk or no risk).

The aim of the present study is to disentangle the effect of two basic defense motivations in a health context (heart disease) on selective exposure to information and the potential downgrade of opposing information: (1) the general motivation to defend one's own opinion and attitudes by approaching confirming information and avoiding disconfirming information (which we denote as 'self-confirming motivation'; see Hart et al., 2009, for a meta-analysis); and (2) the more specific motivation to defend one's self-image with regard to health and physical integrity (self-bolstering and self-defending motivation; Knobloch-Westerwick et al., 2013). Although generally acknowledged as two defense motivations leading to a biased search for information, both types have never been considered in one study simultaneously. As we have seen in the above example, both types of defense motivation can go hand in hand. When individuals with low perceived risk are confronted with high risk feedback, they tend to be more critical of information that is threatening and focus on information that is reassuring (Libermann & Chaiken, 1992). This fulfills the purpose of both motives, as this defends the self-image as well as the physical integrity.

Therefore, we will apply a 2x2 design (experimental factor: risk feedback yes/no, and quasi-experimental factor: perceived risk high/low; see Figure 1) and analyze the impact of the four different conditions on the degree of bias in seeking for health information as well as the quality ratings of the given different types of information. Furthermore, we will consider relevant competence and personality variables as moderators in exploratory analyses.



**Figure 1** Experimental design with resulting conditions

### Research Questions

1. To what extent do two types of defense motivations (self-confirming vs. self-bolstering and self-defending; Knobloch-Westerwick et al., 2013) lead to selective exposure to health information?
2. How do the two types of defense motivations (self-confirming vs. self-bolstering and self-defending; Knobloch-Westerwick et al., 2013) impact the quality rating of various information on the relevant topic (confirming vs. disconfirming and high vs. low quality).

## Hypotheses

- H1. We expect a main effect of the perceived heart disease risk on selective exposure to information which suggests no risk: In the group of higher perceived risk, selective exposure will be stronger compared to the group of lower perceived risk.
- H2. We expect a main effect of the perceived heart disease risk on mean quality rating of information which suggests a risk: In the group of higher perceived risk, the average quality rating of information which suggests a risk is lower compared to the group of lower perceived risk.
- H3. We expect a main effect of the risk feedback on selective exposure to information which suggests no risk: In the conditions with risk feedback, selective exposure will be stronger compared to the conditions with 'no risk' feedback.
- H4. We expect a main effect of the risk feedback on mean quality rating of information which suggests a risk: In the condition with risk feedback, the average quality rating of information suggesting a risk is lower compared to condition with 'no risk' feedback.
- H5. We expect an interaction effect between the perceived and the suggested risk of heart diseases in different forms for each condition on selective exposure:
- a. Low perceived risk combined with 'no risk' feedback (LN) leads to a lower grade of selective exposure on information suggesting no risk compared to low perceived risk combined with 'high risk' feedback (LY).
  - b. Low perceived risk combined with 'high risk' feedback (LY) leads to more selective exposure on information suggesting no risk compared to high perceived risk combined with 'high risk' feedback (HY) and high perceived risk combined with 'no risk'-feedback (HN).
  - c. High perceived risk combined with 'no risk'-feedback (HN) leads to more selective exposure on information suggesting no risk compared to low perceived risk combined with 'no risk' feedback (LN).
  - d. High perceived risk combined with 'high risk' feedback (HY) leads to more selective exposure on information suggesting no risk compared to low perceived risk combined with 'no risk' feedback (LN).
- H6. We expect an interaction effect between the perceived and the suggested risk of heart diseases in different forms for each condition on the quality ratings:
- a. Low perceived risk combined with 'no risk' feedback (LN) leads to equal quality ratings on information suggesting risk and no risk.
  - b. Low perceived risk combined with 'high risk' feedback (LY) leads to higher average quality ratings on information suggesting no risk and lower average quality ratings

on information suggesting risk compared to high perceived risk combined with 'high risk' feedback (HY) and high perceived risk combined with 'no risk'-feedback (HN).

- c. High perceived risk combined with 'no risk' feedback (HN) leads to higher average quality ratings on information suggesting no risk and lower average quality ratings on information suggesting risk compared to low perceived risk combined with 'no risk' feedback (LN).
- d. High perceived risk combined with 'high risk' feedback (HY) leads to higher average quality ratings on information suggesting no risk and lower average quality ratings on information suggesting risk compared to low perceived risk combined with 'no risk' feedback (LN).

## Sampling Plan

### Existing Data

Registration prior to creation of data

### Explanation of existing data

Not applicable

### Data collection procedures

Participants will be recruited through a panel, administered by a professional agency. Only German speaking participants aged 30-65. Data collection will be performed online using the survey software Unipark. Participants can complete the data collection independently using their own device.

### Sample size

Our target sample size is 800 participants.

### Sample size rationale

A power analysis for F tests (ANOVA) assuming small effect sizes was conducted (effect size  $f = .10$ ,  $\alpha = .05$ ,  $1-\beta \text{ err} = .80$ ,  $df = 1$ ).

## Stopping rule

Recruitment will be stopped if a minimum of 800 participants have completed the survey. If the planned sample size cannot be achieved due to practical reasons, the study will be carried out with a reduced sample size.

## Variables

### Manipulated variable

Increased risk of heart disease (yes vs. no): after feedback about the individual score on a measure of dispositional achievement motivation (low vs. high score), participants are confronted with a short informative text stating that a) a low score is associated with a higher risk of developing a heart disease, or b) a high score is associated with a higher risk of developing a heart disease. Thus, 50 % of the participants will receive a statement suggesting their score (e.g., high achievement motivation) increases their risk of developing a heart disease (risk-feedback condition), whereas 50 % of the participants will receive a statement suggesting the opposite score (e.g., low achievement motivation) increases that risk (no risk-feedback condition).

### Measured variables

Objective health information literacy (HILK; Mayer, Holzhäuser, Chasiotis, & Wedderhoff, 2018), subjective health information literacy (SES; Behm, 2015), approach and avoidance motivation (ARES-K; Hartig & Moosbrugger, 2003), emotion regulation (SEK-ES; Ebert, Christ, & Berking, 2013), positive and negative affective state (measured before and after risk feedback; German version of the PANAS; Breyer & Bluemke, 2016), subjective knowledge about heart diseases (self-developed scale), objective knowledge about heart diseases (Bergman et al., 2011), perceived risk of developing a heart disease within the next 5 years (single item), achievement motivation (achievement motivation scale from the BIP; Hossiep & Paschen, 2003), perceived threat/worry (manipulation check; self-developed scale), information seeking goals (GAINS; Chasiotis, Wedderhoff, Rosman, & Mayer, 2018), current information need (manipulation check measured after risk feedback; self-developed scale), selected text-snippets including their information valence ('risk' or 'no risk'), open-ended question concerning the reasons for choosing the selected snippets, source quality rating, perceived credibility of risk statement following feedback about achievement motivation (single item), social desirability, sociodemographic variables

## Indices

Scale means are used as indices, if not suggested otherwise in the respective test manual.

## Design Plan

### Blinding

Participants are blind to the real purpose of the study and are presented a cover story which states that the study is about the prevalence of achievement motivation and the effects our performance-oriented society has on the perceived risk of developing a heart disease.

Participants are also blind to the nature of the two experimental conditions as they do not know there are two such conditions.

### Study design

2x2 design: quasi-experimental factor 'perceived risk' (high vs. low, median-split) and experimental factor 'suggested risk' ('risk' vs. 'no risk') for developing a heart disease; cross-sectional

### Randomization

Participants are randomly assigned to two conditions: increased risk of heart disease (yes vs. no); for a description of the exact procedure, see section 'manipulated variable'.

### Study duration

Study duration will be about 60 minutes.

## Analysis Plan

### Statistical models

Similar to Adams et al. (2018), we will encode our search bias DV as difference variable between the frequency of text-snippet selection 'risk' and 'no risk'. The DV is calculated for subjects according to the respective risk indicator (high or low achievement motivation, see section 'manipulated variable'). As methods for statistical analysis to test the hypotheses, we will a)

calculate t-tests for one sample in each group (testing against zero) and b) calculate ANOVAs with simple and three way-interactions.

## Transformations

If our search bias DV turns out to be non-normally distributed, we will apply appropriate transformations which will depend on the kind of deviation from normal distribution.

## Inference criteria

Level of significance is  $p < .05$ .

## Data exclusion

Multivariate outliers will be excluded based on mahalanobis distance. If outlier-corrected analyses are performed, results of analyses including these outliers will also be reported. Participants may be excluded from analyses if major protocol deviations occur (e.g., if they produce more than 50% of missing data).

## Missing data

Full information maximum likelihood estimation, as provided by the lavaan package, will be used to determine if the missing mechanism can be regarded as missing at random or missing completely at random.

## Exploratory analysis

We will exploratorily analyze the effect of several potentially meaningful moderating variables, e.g. health information literacy, on the perceived risk X risk feedback interaction (three way-interactions).

## References

- Adams, J. M., Hart, W., Richardson, K., Tortoriello, G. K., & Rentschler, A. (2018). Monkey see, monkey do: The effect of social influence on selective-exposure bias. *European Journal of Social Psychology, 48*(6), 850-865.
- Behm, T. (2015). Informationskompetenz und Selbstregulation: Zur Relevanz bereichsspezifischer Selbstwirksamkeitsüberzeugungen [Information competence and self-regulation: The relevance of domain-specific self-efficacy]. In A.-K. Mayer (Ed.), *Informationskompetenz im Hochschulkontext [Information competence in the higher education context.]: Interdisziplinäre Forschungsperspektiven [Interdisciplinary research perspectives]* (pp. 151–162). Lengerich, Germany: Pabst Science Publishers.
- Bergman, H. E., Reeve, B. B., Moser, R. P., Scholl, S., & Klein, W. M. (2011). Development of a comprehensive heart disease knowledge questionnaire. *American Journal of Health Education, 42*(2), 74-87.
- Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: an updated systematic review. *Annals of Internal Medicine, 155*(2), 97-107.
- Breyer, B. & Bluemke, M. (2016). Deutsche Version der Positive and Negative Affect Schedule PANAS (GESIS Panel). *Zusammenstellung sozialwissenschaftlicher Items und Skalen*. doi:10.6102/zis242
- Byrne, D. (1961). The repression-sensitization scale: Rationale, reliability, and validity. *Journal of Personality, 29*(3), 334–349.
- Chasiotis, A., Wedderhoff, O., Rosman, T., & Mayer, A.-K. (2018). GAINS. Goals Associated with Health Information Seeking. In Leibniz Institute for Psychology Information (ZPID) (Ed.), *Electronic Test Archives*. Trier, Germany: ZPID. Retrieved from <https://www.testarchiv.eu/retrieval/PSYNDEXTests.php?id=9007528>
- Das, E. (2012). Rethinking the role of affect in health communication. *European Health Psychologist, 14*(2), 27-31.
- Dijkstra, A. (2009). Disengagement beliefs in smokers: Do they influence the effects of a tailored persuasive message advocating smoking cessation? *Psychology and Health, 24*, 791-804.
- Ditto, P. H., & Lopez, D. F. (1992). Motivated skepticism: Use of differential decision criteria for preferred and nonpreferred conclusions. *Journal of Personality and Social Psychology, 63*(4),

568-584.

- Ebert, D. D., Christ, O., & Berking, M. (2013). Entwicklung und Validierung eines Fragebogens zur emotionsspezifischen Selbsteinschätzung emotionaler Kompetenzen (SEK-ES) [Development and validation of a emotion-specific self-report measurement of emotional competences]. *Diagnostica, 59*(1), 17–32.
- Edwards, K., & Smith, E. E. (1996). A disconfirmation bias in the evaluation of arguments. *Journal of Personality and Social Psychology, 71*(1), 5-24.
- Hart, W., Albarracín, D., Eagly, A. H., Brechan, I., Lindberg, M. J., & Merrill, L. (2009). Feeling validated versus being correct: a meta-analysis of selective exposure to information. *Psychological Bulletin, 135*(4), 555-588.
- Hartig, J., & Moosbrugger, H. (2003). Die "ARES-Skalen" zur Erfassung der individuellen BIS- und BAS-Sensitivität [The ARES-Scales as a Measurement of Individual BIS- and BAS-sensitivity: Development of a Long and a Short Questionnaire Version]. *Zeitschrift Für Differentielle Und Diagnostische Psychologie, 24*(4), 293–310.
- Hossiep, R. & Paschen, M. (2003). *Bochumer Inventar zur berufsbezogenen Persönlichkeitsbeschreibung (BIP)* (2nd Ed.). Göttingen, Germany: Hogrefe.
- Knobloch-Westerwick, S., Johnson, B. K., & Westerwick, A. (2013). To your health: Self-regulation of health behavior through selective exposure to online health messages. *Journal of Communication, 63*(5), 807-829.
- Krohne, H. W., & Hock, M. (2011). Anxiety, coping strategies, and the processing of threatening information: Investigations with cognitive-experimental paradigms. *Personality and Individual Differences, 50*(7), 916–925.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin, 108*(3), 480-498.
- Liberman, A., Chaiken, S. (1992). Defensive Processing of Personally Relevant Health Messages. *Personality and Social Psychology Bulletin, 18*(6), 669–679.
- Mayer, A.-K., Holzhäuser, J., Chasiotis, A. & Wedderhoff, O. (2018). Assessing health literacy by performance tests: The Health Information Literacy Knowledge Test (HILK). In A.-K. Mayer (Ed.), *Health literacy across the life span* (pp. 127-145). Lengerich, Germany: Pabst Science Publishers.

- Miller, S. M. (1987). Monitoring and blunting: Validation of a questionnaire to assess styles of information seeking under threat. *Journal of Personality and Social Psychology*, 52(2), 345–353.
- Olson, J. M., & Stone, J. (2014). The Influence of Behavior. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *The Handbook of Attitudes*, (pp. 223-271). London, UK: Psychology Press.
- Sherman, D. K., & Cohen, G. L. (2002). Accepting threatening information: Self-Affirmation and the reduction of defensive biases. *Current Directions in Psychological Science*, 11(4), 119-123.
- Sherman, D. K., Mann, T., & Updegraff, J. A. (2006). Approach/avoidance motivation, message framing, and health behavior: Understanding the congruency effect. *Motivation and Emotion*, 30(2), 164-168.
- Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., & Brand, H. (2012). Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*, 12(1).
- Updegraff, J. A., Brick, C., Emanuel, A. S., Mintzer, R. E., & Sherman, D. K. (2015). Message framing for health: Moderation by perceived susceptibility and motivational orientation in a diverse sample of Americans. *Health Psychology*, 34(1), 20-29.
- Updegraff, J. A., Sherman, D. K., Luyster, F. S., & Mann, T. L. (2007). The effects of message quality and congruency on perceptions of tailored health communications. *Journal of Experimental Social Psychology*, 43(2), 249-257.
- van 't Riet, J., & Ruiter, R. A. (2013). Defensive reactions to health-promoting information: An overview and implications for future research. *Health Psychology Review*, 7(1), 104-136.