

Risk perception, risk communication and health behavior change

Health psychology at the University of Konstanz

Britta Renner, Harald Schupp, Manja Vollmann, Freda-Marie Hartung, Ralf Schmäzle, and Martina Panzer

University of Konstanz

Abstract. At a broad level, the Konstanz Health Psychology research group aims at understanding the judgment and decision making processes underlying health-relevant behaviors. Towards this goal, several more specific research agendas are addressed. A primary aim is to understand the transition from knowing about risks to personally feeling at risk. In particular, we study the reception of relevant personalised health feedback such as feedback on cholesterol levels or blood pressure. Contrary to the dominant models of biased reasoning, our results on feedback reception suggest that people respond adaptively to health risk feedback. Furthermore, we study changes in the perception of health risk across time and their associated effects on the onset, maintenance, and cessation of health-relevant behaviors. In current research, we try to utilize methods from affective neuroscience for assessing affective and intuitive processes relevant to personal feelings of risk. These efforts are motivated by the broader goal of developing theoretical frameworks that can be applied across a range of behavioral domains.

Key words: risk perception, health behavior change, reception of feedback

The health psychology research group at the University of Konstanz is interested in the judgment and decision-making processes underlying health-relevant behaviors. A main goal is to understand the transition from knowing about risks to personally feeling at risk. Furthermore, the perception of health risks is a dynamic phenomenon. Thus, we aim to understand dynamic changes in risk perception and their associated effects on the onset, maintenance, and cessation of health-relevant behaviors. These efforts are motivated by the broader goal of developing theoretical frameworks that can be applied across a range of behavioral domains.

Health risk perception

Perceiving a health threat is the most obvious prerequisite for the motivation to change risk behaviors. If one is not aware of the risky nature of one's actions, motivation for change cannot emerge. Curiously, it is not sufficient to know about health risks to change health behaviors as for example most smokers readily admit that smoking can cause diseases (general risk perception). What is most relevant for changing health behaviors is feeling personally at risk (individual risk perception). This perspective demands differentiation between these types of risk perception emphasizing in particular the study of person-

alized risk to elicit health behavior change (Renner & Schupp, 2005; Renner, Schmäzle, & Schupp, in press). Previous research pictured personal risk perception as prone to biases in both judging personal risk for diseases and the reception of risk feedback. Our research challenges this deficit-oriented perspective and is more consistent with the notion that risk perception is adaptive in allocating resources to health-threatening conditions. Furthermore, longitudinal studies of risk perception are needed to capture changes in risk perception across time.

Reception of health risk communication

An often-replicated finding is that people receiving bad news related to their health (e.g., high cholesterol reading) rated the test result as less accurate and less serious than people receiving good news (cf., Croyle, Sun, & Hart, 1997, Lerman, Croyle, Tercyak, & Hamann, 2002). The differential acceptance of negative versus positive risk information is commonly interpreted as evidence for motivated reasoning, arguing that people who are informed that they have an elevated risk try to minimize the seriousness of the health threat and derogate the validity of the risk factor test in order to maintain a favorable sense of their health.

This assumption of motivated reasoning has been challenged by the “cue adaptive reasoning account” (CARA; Renner, 2004; Panzer & Renner, in press). The CARA model assumes that negative feedback and unexpected feedback serve as cues that draw attentional resources for elaborate stimulus processing. As a by-product of the more elaborate cognitive analyses of negative or unexpected information, plausible alternative explanations are considered more frequently and therefore negative or unexpected information is less likely to be accepted than expected positive information. Evidence from public cholesterol and blood pressure screenings in Germany and South Korea provided first supporting evidence for the CARA notion (Renner, 2004; Panzer & Renner, in press). The results showed that participants receiving negative or unexpected test results were sensitive to the quality of the given information indicating elaborate information processing. Conversely, participants receiving expected positive test results were insensitive towards the quality of the given feedback, accepting low and high quality feedback equally. In a world where many stimuli and varying demands compete for processing resources, investment of processing resources to self- and survival relevant stimuli fosters successful adaptations to environmental challenges and demands (c.f., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Ditto, Scepansky, Munro, Apanovitch, & Lockhart, 1998). Accordingly, the preferential allocation of processing resources to negative or unexpected information appears to be an adaptive mobilization response, which serves the efficient extraction of critical information from the environment in order to protect the organism from future harm (cf., Baumeister et al., 2001; Ditto et al., 1998; Taylor, 1991).

The dynamics of risk perception

A further aim of our research is to examine changes in reactions toward risk communication across time. From the perspective of coping, negative events compared with positive events elicit particularly strong immediate emotional responses, followed by behavioral responses to minimize or cope with adverse events. Accordingly, reactions toward risk feedback should show a dynamic shift over time as motivational and coping pressures change. We found evidence for such a dynamic shift in immediate and delayed reactions toward risk feedback (Renner, 2003). Reactions toward cholesterol risk feedback indicate a change of the motivational focus from “hot affect” and fear control to more cognitive event representations and danger control as proposed by the dual process theory (Leventhal, Brissette, & Leventhal, 2003). Using memory measures as a probe, participants receiving unfavorable risk feedback showed evidence for hindsight bias immediately after receiving feedback indicating amplified fear control. However, 3 weeks later the same participants demonstrated a reversed hindsight bias indicating augmented danger control. Thus, the data suggest that the type of recall errors vary systematically as a phase-specific phenomenon, which might reflect adaptive changes in

self-regulatory processes and coping strategies (Lazarus & Folkman, 1984; Leventhal et al., 2003).

The dynamic nature of risk perception becomes also apparent in the course of health behavior change. The notion that people adopt precautionary health behaviors in order to reduce risks for their health is explicitly or implicitly inherent in most social cognition theories of health behavior (Weinstein, Rothman, & Nicolich, 1998). Assuming that people take precautions in order to reduce their risk implies that they should perceive themselves as being less at risk as a consequence of their behavior change (Brewer, Weinstein, Cuite, & Herrington, 2004; Weinstein, 2003). Evidence for changes in risk perceptions has been recently found in the context of an acute livestock epidemic (Renner, Schütz, & Sniehotta, 2008). We found that increases in preventive nutrition over time were significantly associated with decreases in perceived risk. Thus, preventive behavior changes appear to lead to corresponding changes in risk perception, indicating adaptive accuracy. While there is a wealth of empirical studies examining the impact of risk perceptions on subsequent behavior change, the aspect of *adaptive accuracy* of risk perception has been comparably neglected so far. The consideration of adaptive accuracy and risk reappraisal effects may have important theoretical and practical implications (cf., Renner et al., 2008). For instance, the reduction of personal risk is a key motive for changing risk behaviors (Weinstein, 2003), and consequently, decreases in perceived risk after changing behavior might be a necessary motivational prerequisite for the maintenance of protective behaviors.

Motives for health behaviors change

Engagement in preventive health behaviors is not merely determined by the awareness of objective health risks but it is mainly influenced by health beliefs and specific health cognitions (Renner & Schwarzer, 2003). The most prominent social cognitive models specifying determinants of health behavior are the Health Belief Model, the Theory of Planned Behavior, the Protection Motivation Theory, and the Health Action Process Approach (cf., Armitage & Connor, 2000; Renner & Schwarzer, 2003). The current revised versions of these health behavior models share several common predictors such as personal vulnerability, outcome expectancies, perceived self-efficacy, and planning which are considered to play a major role in the behavior change process (Renner et al., 2008).

However, social cognitive models of health behavior might not be equally valid across the lifespan. Physical health undergoes life-long development and change (Penny, Bennett, & Herbert, 1994; Spiro, 1999), and similarly, health becomes an increasingly important life goal with advancing age (Hooker & Kaus, 1994; Staudinger, Freund, Linden, & Maas, 1999). Therefore, we are examining whether there are age-related differences in health-related cognitions and in the functionality of health behavior change (Renner & Staudinger, in press).

Longitudinal data from German and Korean samples suggest that perceived risk and its impact on motivational behavior change processes greatly vary across the lifespan. Younger adults in comparison to middle-aged and older adults perceive themselves as being less vulnerable for diseases. Moreover, with increasing age, risk perception appears to become a more important motivational drive even though the actual health status may not have changed (Renner, Knoll, & Schwarzer, 2000; Renner, Spivak, Kwon, & Schwarzer, 2007; Schwarzer & Renner, 2000). This suggests that middle-aged and older adults might regard physical activity as an explicit health behavior, whereas younger adults consider it as a lifestyle behavior driven by social influence and daily leisure habits. Thus, the function of health-related behaviors appears to change over the lifespan. Accordingly, theoretical models and interventions should be tailored to fit the prevailing motive structure of the different age groups.

Other research lines: Personality, social processes and health

Numerous studies to date show convincingly that personal resources promote mental as well as physical health (cf., Scheier, Carver, & Bridges, 2001). As mediating processes, a "social pathway" has been suggested as central link between personal resources and health (cf., Peterson & Bossio, 2001). Accordingly, in current research, we explore how personal resources such as optimism or curiosity serve as „social pathway“ to health by examining reactions of social interaction partners in dependence on personal resources (Vollmann, Renner, & Weber, 2007; Weber, Vollmann, & Renner, 2007).

Current research

Our current research activities utilize methods from affective neuroscience for assessing affective and intuitive processes relevant to personal feelings of risk. Current models conceptualize risk as the probability of future harm. However, objective probability x severity risk assessments by experts often diverge greatly from lay reactions towards these hazards. Thus, lay risk beliefs, in particular personal risk perception, involve apparently more than just cognitions about probabilities and consequences. Therefore, recent models have started to consider the role of affective and intuitive processes for risk perception, even though empirical studies are scarce (e. g., Finucane & Holup, 2006; Loewenstein, Weber, Hsee, & Welch, 2001). We utilize methods from affective neuroscience to explore intuitive processes of health-related risk perceptions, which are difficult to observe using traditional methods. Our first results appear promising, suggesting that perceived risk guides selective attention processes already early in the processing stream (Schmälzle, Renner, & Schupp, 2008).

References

- Armitage, C. J. & Conner, M. (2000). Social cognition models and health behaviour: A structured review. *Psychology and Health, 15*, 173–189.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323–370.
- Brewer, N. T., Weinstein, N. D., Cuite, C. L., & Herrington, J. E., Jr. (2004). Risk perceptions and their relation to risk behavior. *Annals of Behavioral Medicine, 27*, 125–130.
- Croyle, R. T., Sun, Y. C., & Hart, M. (1997). Processing risk factor information: Defensive biases in health-related judgments and memory. In K. L. Petrie & J. A. Weinman (Eds.), *Perceptions of health and illness* (pp. 267–290). Amsterdam: Harwood.
- Ditto, P. H., Scepansky, J. A., Munro, G. D., Apanovitch, A. M., & Lockhart, L. K. (1998). Motivated sensitivity to preference-inconsistent information. *Journal of Personality and Social Psychology, 75*, 53–69.
- Finucane, M. L. & Holup, J. L. (2006). Risk as a value: Combining Affect and analysis in risk judgements. *Journal of Risk Research, 9*, 141–164.
- Hooker, K. & Kaus, C. R. (1994). Health-related possible selves in young and middle adulthood. *Psychology and Aging, 9*, 126–133.
- Lazarus, R. S. & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lerman, C., Croyle, R. T., Tercyak, K. P., & Hamann, H. (2002). Genetic testing: Psychological aspects and implications. *Health Psychology, 70*, 784–797.
- Leventhal, H., Brissette, I., & Leventhal, E. A. (2003). The common-sense model of self-regulation of health and illness. In L. D. Cameron & H. Leventhal (Eds.), *The self-regulation of health and illness behavior* (pp. 42–65). Howard: Routledge.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*, 267–286.
- Panzer, M. & Renner, B. (in press). To be or not to be at risk: Spontaneous reactions toward risk feedback. *Psychology & Health*.
- Penny, G., N., Bennett, P., & Herbert, M. (1994). *Health psychology: A lifespan perspective*. Chur, Switzerland: Harwood Academic Publishers.
- Peterson, C. & Bossio, L. M. (2001). Optimism and physical well-being. In E. C. Chang (Ed.), *Optimism & pessimism: Implications for theory, research, and practice* (pp. 127–145). Washington: American Psychological Association.
- Renner, B. (2003). Hindsight bias after receiving self-relevant health risk information: A motivational perspective. *Memory, 11*, 455–472.
- Renner, B. (2004). Biased reasoning: Adaptive responses to health risk feedback. *Personality and Social Psychology Bulletin, 30*, 384–396.
- Renner, B., Knoll, N., & Schwarzer, R. (2000). Age and body weight make a difference in optimistic health beliefs and nutrition behaviors. *International Journal of Behavioral Medicine, 7*, 143–159.
- Renner, B., Kwon, S., Yang, B.-H., Paik, K.-C., Kim, S. H., Roh, S., Song, J., & Schwarzer, R. (2008). Social-cognitive predictors of eating a healthy diet in South Korean men and women. *International Journal of Behavioral Medicine, 15*, 4–13.
- Renner, B., Panzer, M., & Oeberst, A. (2007). Risikokommunikation. In B. Six, U. Gleich, & W. Gimpler (Hrsg.), *Lehrbuch Kommunikationspsychologie* (S. 251–270). Weinheim: Beltz.
- Renner, B., Schmälzle, R., & Schupp, H. (in press). Risikowahrnehmung und Risikokommunikation. In J. Bengel & M. Je-

- rusalem, *Handbuch für Gesundheitspsychologie und Medizinische Psychologie*. Göttingen: Hogrefe.
- Renner, B. & Schupp, H. (2005). Risikowahrnehmung und Gesundheitsverhalten. In R. Schwarzer (Hrsg.), *Gesundheitspsychologie. Enzyklopädie der Psychologie* (S. 173–193). Göttingen: Hogrefe.
- Renner, B., Schütz, B., & Sniehotta, F. (2008). Preventive health behaviour and adaptive accuracy of risk perceptions. *Risk Analysis*, 28, 1–8.
- Renner, B. & Schwarzer, R. (2003). Social-cognitive factors predicting health behavior change. In J. Suls & K. Wallston (Eds.), *Social psychological foundations of health and illness* (pp. 169–196). Oxford: Blackwell.
- Renner, B., Spivak, Y., Kwon, S., & Schwarzer, R. (2007). Age and health behaviour change: Differences in predicting physical activity of South Korean adults. *Psychology & Aging*, 22, 482–493.
- Renner, B. & Staudinger, U. M. (in press). Gesundheitsverhalten alter Menschen. In A. Kuhlmeier & D. Schaeffer. *Handbuch Alter, Gesundheit und Krankheit*. Bern: Huber.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (2001). Optimism, pessimism, and psychological well-being. In E. C. Chang (Ed.), *Optimism and pessimism: Implications for theory, research, and practice* (pp. 189–216). Washington, DC: American Psychological Association.
- Schmälzle, R., Renner, B., & Schupp, H. (2008). *Intuitive Judgments of HIV Risk: An Event-Related Potential Study*. Poster presented at DGPA Spring School "Biopsychology of Emotions", Seon, Germany, March 27–30 2008.
- Schwarzer, R. & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology*, 19, 487–495.
- Spiro, A. (1999). Health in midlife: Toward a life-span view. In S. L. Wills & J. D. Reid (Eds.), *Life in the middle: Psychological and social development in middle age*. San Diego, CA: Academic Press.
- Staudinger, U. M., Freund, A., Linden, M., & Maas, I. (1999). Self, personality, and life management: Psychological resilience and vulnerability. In P. B. Baltes & K. U. Mayer (Eds.), *The Berlin Aging Study: Aging from 70 to 100* (pp. 302–326). New York: Cambridge University Press.
- Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization minimization hypothesis. *Psychological Bulletin*, 110, 67–85.
- Vollmann, M., Renner, B., & Weber, H. (2007). Optimism and social support: The providers' perspective. *The Journal of Positive Psychology*, 2, 205–215.
- Weber, H., Vollmann, M., & Renner, B. (2007). The spirited, the observant, and the disheartened: Social concepts of optimism, realism, and pessimism. *Journal of Personality*, 75, 169–197.
- Weinstein, N. D. (2003). Exploring the links between risk perceptions and preventive health behavior. In J. Suls & K. A. Wallston (Eds.), *Social psychological foundations of health and illness* (pp. 22–53). Malden, MA: Blackwell Publishers.
- Weinstein, N. D., Rothman, A. J., & Nicolich, M. (1998). Use of correlational data to examine the effects of risk perceptions on precautionary behavior. *Psychology & Health*, 13, 479–501.

Prof. Dr. Britta Renner

University of Konstanz
 Department of Psychology
 Psychological Assessment & Health Psychology
 PO Box 47
 78457 Konstanz
 Germany
 e-mail: britta.renner@uni-konstanz.de