

The narrative bias revisited: What drives the biasing influence of narrative information on risk perceptions?

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Narrative bias

- Many examples from Psychology where likelihood estimates deviate from probability theory
- ***Narrative bias***: the excessive influence of narrative information, exemplars and testimonies, on...
 - subjective probability estimates
 - perceived risk (value dimension, i.e. severity of outcome)
 - behavior
- ***The encounter frequency theory*** (Obrecht et al. 2009): each piece of information (statistic or single narrative case) is attributed equal weight when forming a judgment
- ***Negativity bias***: information regarding presence of a risk is weighed stronger than information on its absence

Study

- Experiment 1
 - effects of statistical info and narratives on estimated probability and risk
 - symmetry of narrative bias (negative bias)
- Experiment 2
 - narrative bias caused by absolute or relative number of narratives?
 - narrative bias artifact of conversational norms or recency effect
 - do people seek out additional narrative information?
- Content domain of vaccination risks
 - more and more people consult internet for health decisions
 - narrative evidence common feature anti-vaccination websites

Information provided on VAE

- Vaccine-adverse events (VAE) for fictitious disease *dysomeria*
- Statistical probability of VAE provided (% and pictograph)
- Followed by experiences on simulated bulletin board

I had about a week of fever after my dysomeria vaccination. I do not know if that was a side effect but I was confined to the bed for quite a while and could hardly move a muscle. I'm just glad it's over now and I can get back to normal life.
Bill

My doctor had told me that I should get vaccinated against dysomeria. Well I'm not really a fan of needles, but last week I just went and got it over with. Afterwards: no problems at all and I actually went to the gym to do my regular work out right afterwards. No biggie. Sarah

Dependent variables

Construct	Scale type	Wording
subjective probability	% estimate	What is the probability of adverse events if you get vaccinated?
	7-point rating scale (1 = <i>almost zero</i> , 7 = <i>almost certain</i>)	
perceived risk	visual analog scale (0 = <i>not risky at all</i> , 100 = <i>very risky</i>)	How risky do you judge the vaccination to be?
perceived severity	7-point rating scale (1 = <i>not severe</i> , 7 = <i>very severe</i>)	How severe do you judge the possible adverse effects of the vaccination to be?
intention to get vaccinated	7-point rating scale (1 = <i>def. not vac.</i> , 7 = <i>def. vaccinated</i>)	If you had the possibility to get vaccinated in the next week, what would you do?

Experiment 1

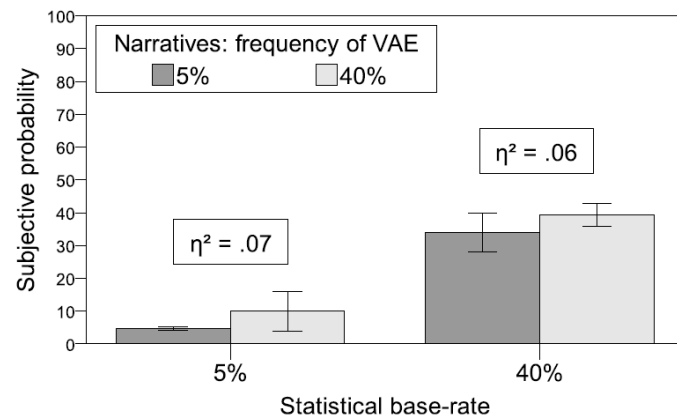
- 2 x 2 x 3 between-subject design (270 students)
 - statistical probability VAE (2): 5% or 40%
 - narratives reporting VAE (2): 5% or 40% (out of 20 narratives)
 - first dependent variable (3): subjective probability (% or rating) or perceived risk
- *Subjective Numeracy Scale* (Fagerlin et al., 2007)
 - 8 items on 6-point scale, e.g. “How good are you at working with fractions?”
- Results
 - effect statistical information > narrative information for subjective probability, but reverse for perceived risk!
 - for low (but not high) numeracy: % estimate function of # narratives VAE
 - for high numeracy larger effect of statistical rate on 7-point subjective probability
 - carry-over effects: considering risk first makes probability estimates more biased
 - negative bias for risk, but not percent estimates

Experiment 1

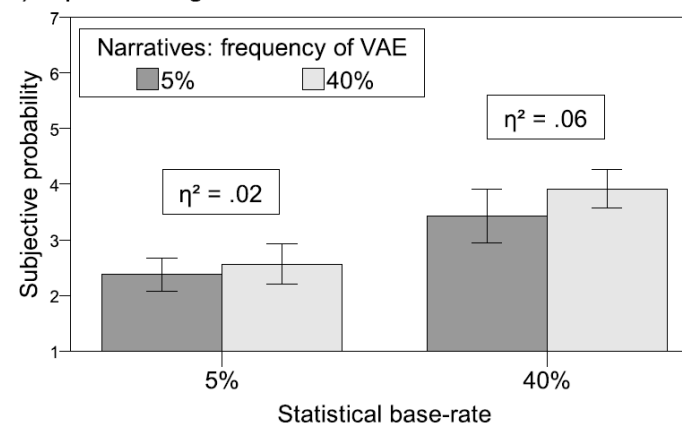
subjective probability

perceived risk

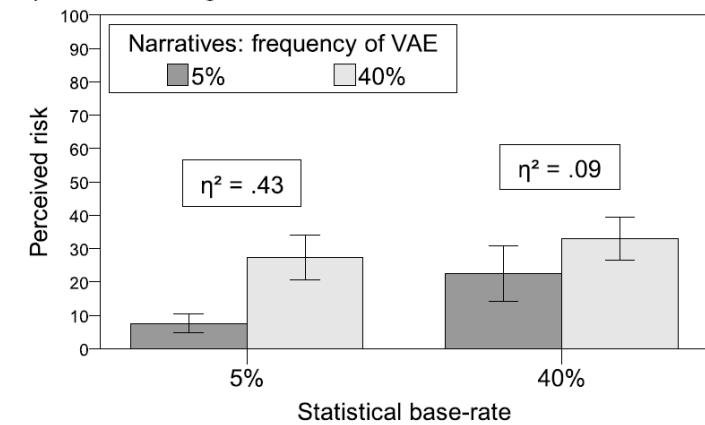
A) Percent estimate



B) 7-point rating scale



C) Visual analog scale



Experiment 2

- 2 x 2 x 3 + 4 between-subjects design (464 subjects Amazon Mechanical Turk)
 - first dependent variable (2): subjective probability or perceived risk
 - number of narratives (2): 10 or 20
 - narratives reporting VAE (3): 10%, 20% or 40%
 - optional narrative information (2) and sequence statistical and narrative info (2)
 - statistical probability constant at 20%
- *Objective* numeracy assessed
 - Berlin Numeracy Test (Cokely et al., 2012)
 - 3-item scale (Schwartz et al., 1997)
- Results
 - relative frequency narratives VAE drives narrative bias, not absolute number
 - high numeracy: generally lower risk perception and weaker narrative bias
 - 78% chose to read narratives; effect the same whether or not freely chosen
 - no recency effect
 - perceived risk (but not subjective probability) and behavioral intention correlated

Discussion

- Narrative information biases interpretation of statistical information
 - Effects depend on dependent measure: stronger effects on perceived risk
 - And perceived risk most strongly associated with behavioral intention
 - Affective component: more rule-based, cognitive reasoning with numerical scales vs. more affective, intuitive responses to verbal scales
- Asking for probability estimate before risk increases influence statistical info
- Both subjective and objective numeracy moderate effects
 - higher subjective numeracy associated with less narrative bias and higher sensitivity to statistical information
 - higher objective numeracy also associated with less narrative bias, and generally lower risk perceptions