

How Anxiety Leads to Suboptimal Decision Under Risky Choice Situation

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Agenda

- Introduction
 - Materials and methods
 - Result and discussion
 - conclusion
 - Q&A
- 



Introduction- Definitions

- ▶ Anxiety is a common emotion that signals the presence of a potential threat or negative outcome, promotes pessimistic appraisals of future events, and impairs affect regulation.
 - ▶ Anxiety can be triggered by any uncertain or novel situation that has the potential for adverse consequences.
- ▶ Incidental Versus accidental anxiety
 - ▶ Integral: it is simulated by some aspect of the decision context itself
 - ▶ Incidental: it is activated by a prior situation or problem that is unrelated to the current decision



Introduction- Definitions

➤ Anecdotal Bias

- Often Statistical information is superior to anecdotal evidence
- Anecdotal evidence consists of a specific historical instance, while statistical evidence is a numerical summary of series of instances
- Researches show anecdotal bias persist even when statistical information objectively dominates the available anecdotal information
- 2 famous examples:
 - Baby Jessica
 - Classic study demonstrating the representativeness heuristic by Kahneman and Tversky

Introduction- Purpose of study

- ▶ The paper examine the impact of anxiety on a decision maker's tendency to over utilize anecdotal information, even when more reliable statistical information is available!
- ▶ What is expect to see:
 - ▶ Activating decisionmakers' anxiety about negative outcome will increase the impact of anecdotal information on decision making.
 - ▶ Worry and anxiety evoke high levels of autonomic arousal.
 - ▶ Accidental and integral anxiety
- ▶ **An extension to study!**
 - ▶ I had the chance to collect new data myself
 - ▶ More focus on the level of risk in decision-making process, how people decide in:
 - ▶ self-relevant vs. others
 - ▶ Health/non health
 - ▶ Negative consequences

Materials and methods

▶ Study 1A:

- ▶ The role of incidental anxiety in enhancing the anecdotal information
- ▶ Choosing an insurance in foreign country
- ▶ Asked before an exam days and during a normal class session
- ▶ Assigned 100 undergraduate students, 46% female, $M_{age}=24.9$ $SD=4.49$

▶ Study 1B:

- ▶ Re-administered study 1A using a different choice task
- ▶ Participants were ask to choose 2 different medications for stomach virus in a foreign country
- ▶ Asked before an exam days and during a normal class session
- ▶ Assigned 96 undergraduate students (52.1% females, $M_{age}=23.57$, $SD =3.39$)

Materials and methods

- ▶ Is it just anxiety or any other negative emotion?
- ▶ Raghunathan and Pham showed while anxiety leads to greater risk aversion, sadness reduces it.
- ▶ Other study similarly reported differences in decision processes evoked by disgust versus fear(both negative) and happiness versus hopefulness(both positive)
- ▶ Study 2:
 - ▶ 2 differences with past 2 studies:
 - ▶ Anecdotal and statistical information are presented separately.
 - ▶ This study examines the persuasive impact of the message
 - ▶ Both anecdotal and statistical comes from the same source
 - ▶ Used a 3 (affect type: anxiety vs. sadness vs. control) x 2 (message type: anecdotal versus statistical) between-subject design
 - ▶ All participants were first randomly assigned to one of the affect type.
 - ▶ Then they were exposed to the message type manipulation, one anecdotal and one statistical
 - ▶ Assigned 226 nonstudent (50.4% females, $M_{age}=39.78$, $SD =14.52$) on a national wide online panel.

Materials and methods

▶ Study 3:

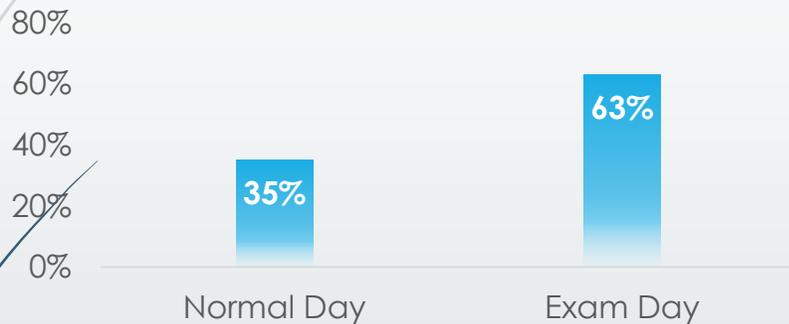
- ▶ This study examine the role of integral anxiety in enhancing the anecdotal bias.
- ▶ Similar to 1B with exception of experimentally manipulated the probabilistic risk of being infected by a contagious decision, instead of using the exam day.
- ▶ Assigned 102 undergraduate students, 48% female, $M_{age}=23.6$ $SD=3.58$

▶ Study 4:

- ▶ This study is a more detailed research of study 3
- ▶ 2 x 2 x 2 experimental design, that means you there are 2*2*2 treatment conditions (self relevant/non-self relevant, high risk/low risk and health/non-health issue, and thus 8 different versions of the survey
- ▶ Assigned 329 nonstudent (38.29% females, $M_{age}=24.15$, $SD =5.03$ on a national wide online panel and UTA student survey

Result and discussion- Study 1A and 1B

DECISION SITUATION- STUDY 1A



An anova on task involvement ($F(1,99)=0.7, p>0.5$) showed no significant difference in task involvement ($M_{\text{exam}}=3.65, M_{\text{regular}}=3.89$),

Anxiety however were significantly different $F(1,99)=26.73, p<0.001$

DECISION SITUATION- STUDY 1B



An anova on task involvement ($F(1,95)=0.03, p>0.5$) showed no significant difference in task involvement ($M_{\text{exam}}=3.08, M_{\text{regular}}=3.34$),

Anxiety however were significantly different $F(1,95)=29.91, p<0.001$

Result and discussion- Study 2

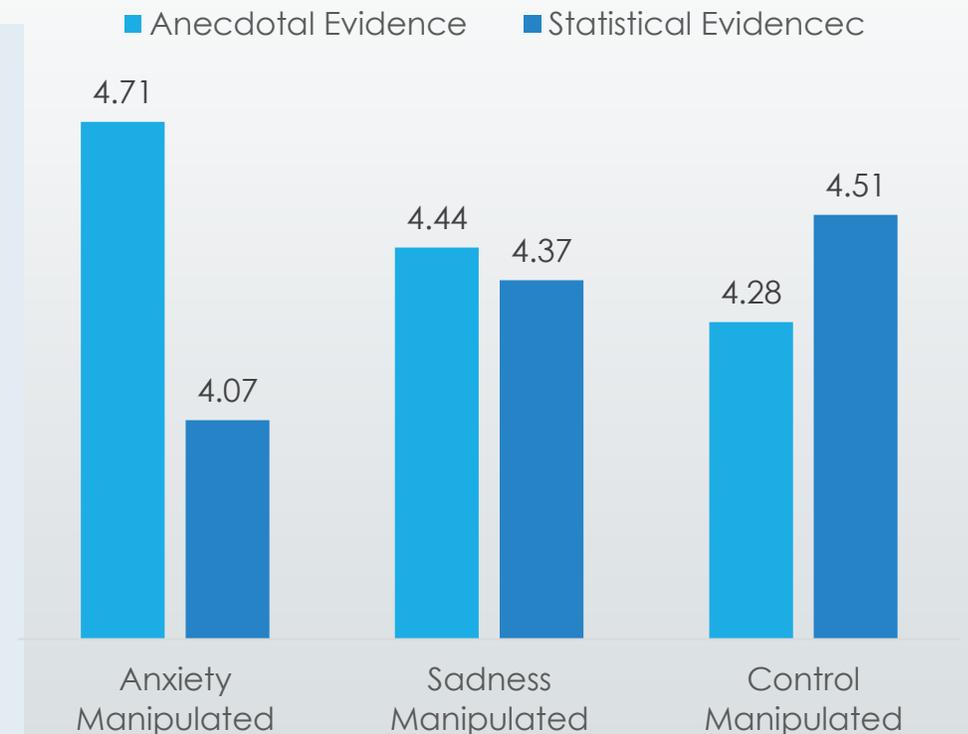
It used a 3 (affect type: anxiety vs. sadness vs. control) x 2 (message type: anecdotal versus statistical) between-subject design,

As expected, participants perceived the emotionality of the experience to be lower in control condition and equal across the anxiety and sadness condition.

Recall and vividness did not vary significantly across affect type condition.

The 3 x 2 ANOVA revealed no significant main effects of affect type or message type on the influence index but yield a significant interaction effect.

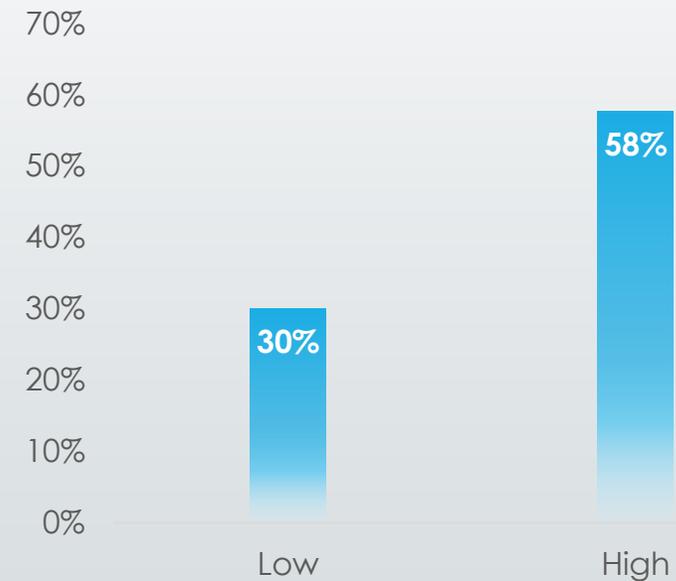
Planned contrast revealed a significant difference in the influence index only across the anxiety condition



Result and discussion- Study 3

- This study examined the role of integral anxiety in enhancing the anecdotal bias
- An increase in manipulated risk of infection was accompanied by greater state anxiety using probabilistic risk was successful.
- Consistence with our expectation, the anecdotal biased increased with higher risk.
- Risk was found to be positively related to:
 - the preference for the anecdotally superior option
 - State anxiety
- When risk and anxiety were both included in the model, the effect of anxiety become insignificant

INFECTION RISK



Result and discussion- Study 4- General model

- ▶ 2 x 2 x 2 experimental design, that means you there are 2*2*2 treatment conditions, and 8 different versions of the survey
- ▶ Manipulation check revealed this result:
 - ▶ Participant had a good understanding of distinguishing health/non-health and (high Q test statistic) while did not completely relate the level of the threat and self relevance to the decision they made.

VARIABLES	(1) model 1
anxiety	0.19*** (0.052)
analysis	-0.21*** (0.057)
scenario2	0.071** (0.035)
agesqr	-0.00056* (0.00030)
Constant	3.16*** (0.38)
Observations	324
R-squared	0.085

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Result and discussion- Study 4- Health/Non Health

➤ Health

VARIABLES	(1) model 1
analysis	-0.32*** (0.086)
risky	0.25*** (0.072)
Constant	3.40*** (0.50)
Observations	176
R-squared	0.120

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

➤ Non-Health

VARIABLES	(1) model 1
stress	0.29*** (0.079)
vividness	-0.21*** (0.072)
scenario2	0.12*** (0.044)
Constant	2.57*** (0.47)
Observations	152
R-squared	0.178

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Result and discussion- Study 4- Self Relevance/Non Self Relevance

Self Relevance

VARIABLES	(1) model 1
risky	0.29*** (0.072)
vividness	-0.18** (0.075)
Constant	2.60*** (0.45)
Observations	161
R-squared	0.120

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Non Self Relevance

VARIABLES	(1) model 1
analysis	-0.35*** (0.078)
severity	-0.17** (0.081)
bad_outcome	0.33*** (0.087)
scenario3	0.16* (0.083)
Constant	3.35*** (0.45)
Observations	166
R-squared	0.174

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Result and discussion- Study 4- High Risk /Low Risk

High Risk

VARIABLES	(1) model 1
worry	0.13* (0.070)
instinct	0.13* (0.067)
analysis	-0.21*** (0.080)
bad_outcome	0.22*** (0.079)
Constant	2.02*** (0.57)
Observations	173
R-squared	0.148

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Low Risk

VARIABLES	(1) model 1
analysis	-0.20** (0.080)
risksqr	0.033*** (0.011)
Constant	3.15*** (0.40)
Observations	155
R-squared	0.081

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1



Questions?