Anomalies

ECO663 Week 2

Rational Choice by a Rational Man

- A rational man makes a rational choice based on

a. Current assets [money, physiological state, psychological capacity, social relationship, feelings]

b. Possible consequences of the choice

c. Likelihood of the consequences [uncertainty]

Assumptions here are…

a. Knowledge of the problem
=> Decision maker (DM) has a clear picture of the problem set of alternatives.

b. Clear preferences
=> DM has a complete ordering over the entire set of alternatives.

c. Ability to optimize, Do not make mistakes
=> DM has all the skill (unlimited capacity) necessary to make whatever complicated calculations are needed to discover his optimal course of action.

Anomalies

- Framing Effect
- Status-Quo Bias
- Preference Reversals
- Sunk Cost Fallacy
- Endowment Effect
- Reference Dependence
- Loss Aversion

Will be discussed under "Prospect Theory"

Framing Effect

The Framing of Decisions and the Psychology of Choice

Amos Tversky; Daniel Kahneman

Science, New Series, Vol. 211, No. 4481. (Jan. 30, 1981), pp. 453-458.

Framing Effect

- Preferences are not independent of problem description.

Any Example???

Example 1

- Problem I

[N=77]

Which of the following options do you prefer?

A. A sure win of $30
[78%]

B. 80% chance to win $45
[22%]

- Problem II [N=77]

Consider the two-stage game.
1st stage: 75% chance to end the game without winning anything, 25% chance to move into the second stage.

2nd stage:
C: a sure win of $30
[74%]
D: 80% chance to win $45
[26%]

- Problem III [N=81]

E. 25% chance to win $30
[42%]

F. 20% chance to win $45
[58%]

Problem II vs. III

Problem II
C: = 0.25*$30 = 25% of winning $30 (= $7.5) [74%]
D: = 0.25*0.8*45=20% of winning $45 (=$9) [26%]

Problem III
E: 25% of winning $30 [42%]
F: 20% of winning $45 [58%]

<= Problem B and C are equivalent problem, stated differently => Resulted in differences in preferences.

Explanations:

- Problem II vs. III

Preferring C to D in Problem II is due to
illusory "certainty effect" = pseudo-certainty effect

<= Problem II is "framed" to gain "certainty effect".

Due to Certainty Effect,
1% reduction of risk
from 1% to 0%
and
from 2% to 1%

are valued quite differently.

Framing "Probabilistic event" or "Risk" as
"certain gain" or "100% elimination of risk" could manipulate people's risk preference.

Example: Health Policy Decision

- Turkish government is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two programs to combat the disease have been proposed.

If program A is adopted, 200 people will be saved.

If program B is adopted,
1/3 probability that 600 people will be saved and
2/3 probability that no people will be saved.

If program A is adopted, 200 people will be saved.

If program B is adopted,
1/3 probability that 600 people will be saved and
2/3 probability that no people will be saved.

Which policy would you prefer?

⇒Majority choose program A

⇒Risk Averse

Health Policy Decision

- Turkish government is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two programs to combat the disease have been proposed.

If program A is adopted, 400 people will die.

If program B is adopted,
1/3 probability that nobody will die and
2/3 probability that all 600 people will die.

If program A is adopted, 400 people will die.

If program B is adopted,
1/3 probability that nobody will die and
2/3 probability that all 600 people will die.

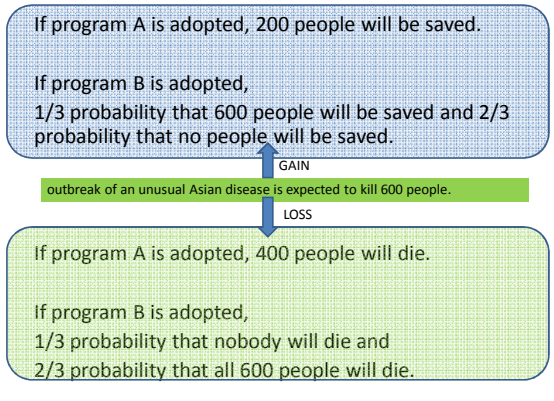
Which program would you choose?

⇒Majority choose program B.

⇒Risk taking

Choice involving Gains => Risk Averse

Choice involving Losses => Risk Taking



ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES
Vol. 76, No. 2, November, pp. 149–188, 1998
ARTICLE NO. OB982804

All Frames Are Not Created Equal: A Typology and Critical Analysis of Framing Effects

Irwin P. Levin
The University of Iowa
Sandra L. Schneider
The University of South Florida
and
Gary J. Gaeth
The University of Iowa

3 types of framing (Levin et al. 1998)

1. Attribute framing

- A single attribute of a given object is framed positively or negatively

e.g. 80% lean meat vs. 20% fat
e.g. 80% accuracy vs. 20% error rate
e.g. 80% survival vs. 20% death (surgery)

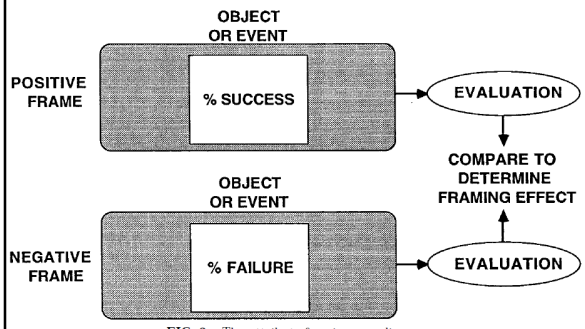
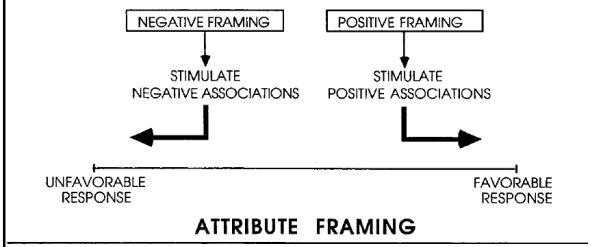


FIG. 2. The attribute framing paradigm.



2. Goal framing

- Potential to provide a benefit/gain (positive frame)
- Potential to prevent/avoid a loss (negative frame)

e.g. skin cancer:

negative consequences of not applying sunscreen

vs.

positive consequences of applying sunscreen.

*Under medical context, loss (negative frame) has greater impact.

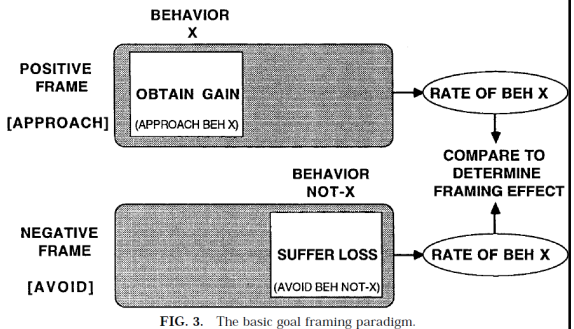


FIG. 3. The basic goal framing paradigm.

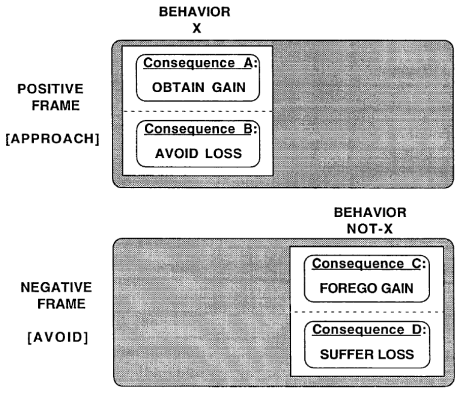


FIG. 4. Variations in the goal framing paradigm.

3. Risky choice framing

– Discrete choices between a risky and a riskless option of equal expected value depended on whether the options were described in positive terms (lives saved) or in negative terms (lives lost).

e.g. Asian Disease Problem [% saved vs. % death]

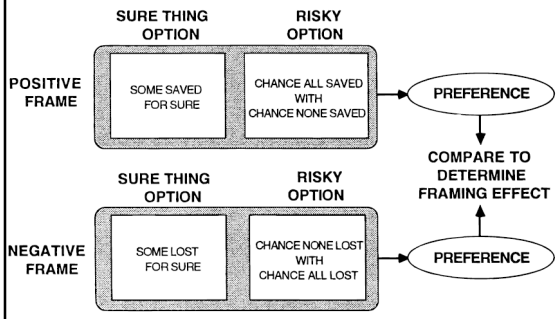
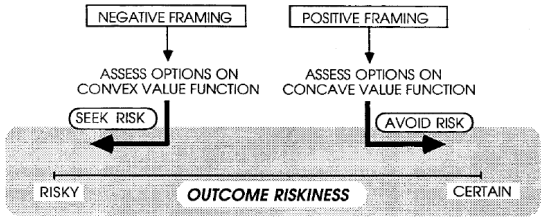


FIG. 1. The standard risky choice framing paradigm.



RISKY CHOICE FRAMING

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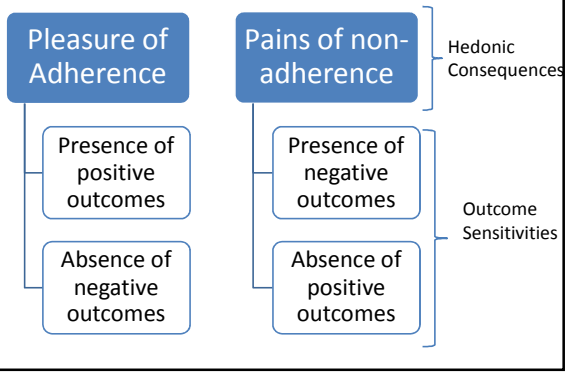
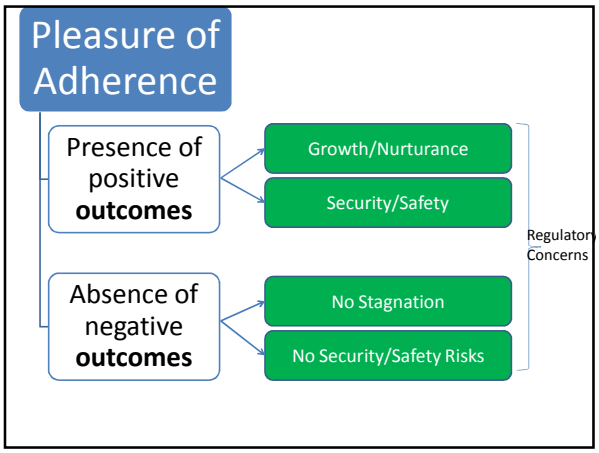
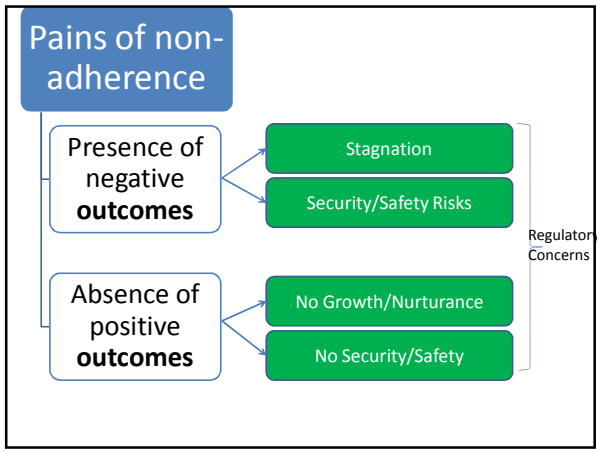
Special issue article: The social psychology of climate change

Effects of message framing in policy communication on climate change

MAURO BERTOLOTTI* AND PATRIZIA CATELLANI
Department of Psychology, Catholic University of Milan, Milan, Italy



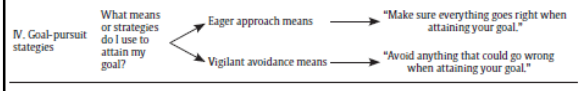


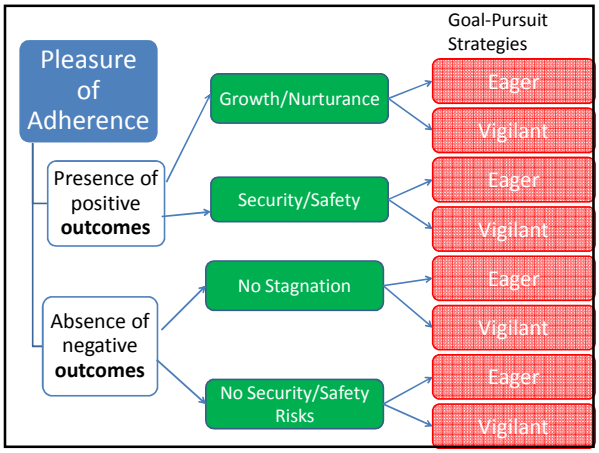


Under climate change policy setting,

Eager approach => promoting renewable energy production. Pursed by proposing investment in new, efficient and environment-friendly sources.

Vigilant avoidance => intervening on greenhouse gas emissions. Aim at reducing and removing the negative impact on climate of older methods of energy production. (pollution tax, quotas etc.)





Objective of the study:

What kind of combination(s) of framing levels result in the most persuasive communication of climate change policies?

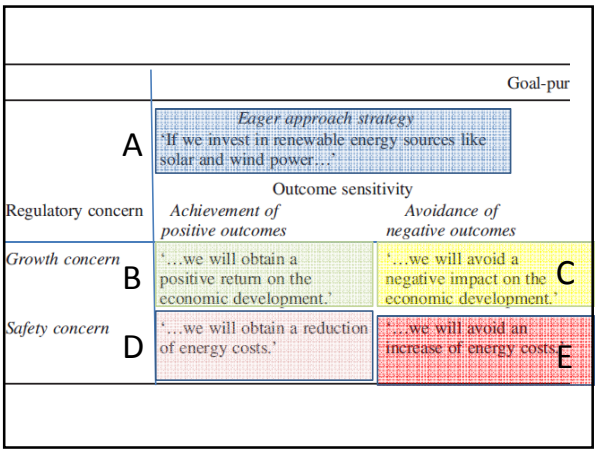
Study 1

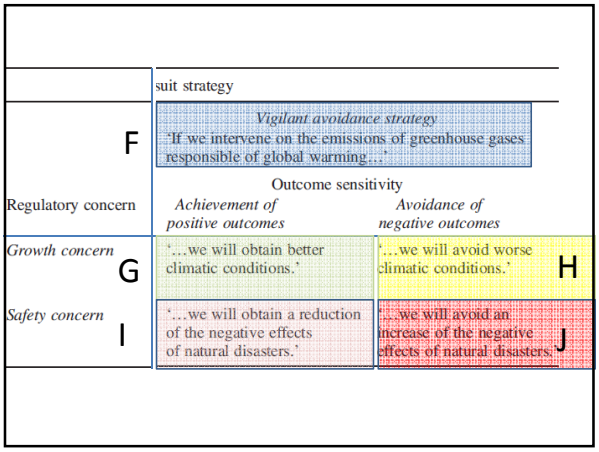
- A candidate in national elections promises…

a) Investments on renewable energy policy (eager approach strategy)

b) Interventions on greenhouse gas emissions (vigilant avoidance strategy)

<= Goal-pursuit strategies





Hypotheses to be tested

H1: eager approach strategy (renewable energy) with positive growth-related outcomes [A+B] is supported (more than with negative growth-related outcomes [A+C])

H2: vigilant avoidance strategy (GHG emission) with the avoidance of negative safety-related outcomes [F+J] is supported (more than with positive safety-related outcomes [F+I])

H3: no difference between A + (D or E)
no difference between F + (G or H)

Experiment

N = 95, university students

2 (outcome sensitivity: presence of positive vs. absence of negatives) × 2 (regulatory concern: growth vs. safety)
⇒A + (B, C, D or E)
⇒F + (G, H, I or J)

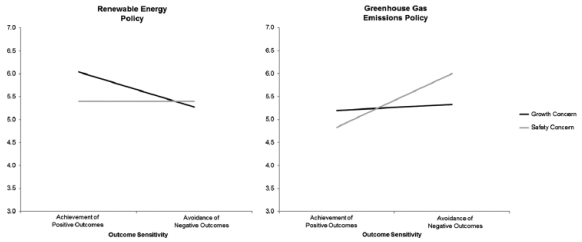
For eager approach or vigilance avoidance strategy

Experiment Procedure

- Baseline attitudes: renewable energy policy and GHG policy rated with 1 (not at all) to 7 (very much) scale.
- Each respondent read two statement (1. eager approach with B, C, D or E description, 2. vigilant avoidance with G, H, I or J description)
- Asked to express the **degree of agreement** (" To what extent do you agree with the statement you have just read?") [1 (not at all) ~ 7 (very much)] and **voting intention** ("Would you vote for a politician making this statement?") **1** (probably not) ~ 7 (probably yes)

Results

- Baseline: M(eager) = 5.25, M(vigilance)=5.37
- (A+B) > (A+C) ; (A+D) ~ (A+E)
- (F+G)~ (F+H) ; (F+I) < (F+J)



Implications:

- A policy message focused on **renewable energy sources** is more persuasive when it is framed in terms of the **positive outcomes** that may be achieved by adopting the policy and when the content of the message emphasizes **growth as the primary concern**.

- A message focused on **greenhouse gas emissions** is more persuasive when it is framed in terms of the **negative outcomes** that may be avoided by adopting the policy and when the content of the message emphasizes **safety** as the primary concern.

Psychology, Health & Medicine, 2013
Vol. 18, No. 6, 645–653, http://dx.doi.org/10.1080/13548506.2013.766352

Routledge
Taylor & Francis Group

The framing effect in medical decision-making: a review of the literature

Jingjing Gong[a,1], Yan Zhang[b,1], Zheng Yang[c], Yonghua Huang[a], Jun Feng[a] and Weiwei Zhang[a]*

Medical Decision Making and Framing Example

Case 1: Lung cancer treatment [surgery vs. radiation]

- Frame [survival rate vs. mortality rate]

⇒Surgery if survival rate
⇒Radiation if mortality

Risk seeking if positively framed, risk averse if negatively framed <=reversed pattern is found.

(McNeil et al. (1982) On the elicitation of preferences for alternative therapies. The New England Journal of Medicine, 306, 1259-1262)

Case 2: Preventive behavior [human papillomavirus (HPV) vaccine]

- Frame [70% effective vs. 30% ineffective]

⇒Supported if positive framing
⇒Supported less if negative framing

(Bigman et al. (2010) Effective or ineffective: Attribute framing and the human papillomavirus (HPV) vaccine. Patient Education and Counseling, 81, S70-S76)

Case 3: Preventive Behavior [Skin cancer + skin protection]

- Frame [risks of sun exposure (negative frame) vs. benefits of sunscreen (positive frame)]

⇒Negative frame is more effective for this study.

(Thomas et al (2011) "Appearance matters: the frame and focus of health messages influences beliefs about skin cancer" British Journal of Health Psychology, 16, 418-429)

⇒Findings for Preventive Behavior are mixed.

⇒According to the meta analysis by Gallagher and Updegraff (2012), **gain-framed messages** were more likely to encourage **prevention behaviors** (skin cancer, smoking cessation, physical activity)

Case 4: Detection Behavior [mammograms, screening for prostate cancer]

=> **Results are mixed**. Some studies find effective negative frame to engage in early detection behavior (Rothman et al. 1990), some found positive frames to be more effective (Apanovitch et al. 2003), and some did not find any difference in framing (Arora, 2000; Williams et al,2001; Gallagher and Updegraff, 2012).

Results are affected by certain variables, such as

a) Perceived susceptibility to the disease
(higher perceived risk <= effective negative frame)

b) Culture (US, South Korea, Japan)

Appeal	Frame	Examples
Individualistic	Gain	If little concern can protect your health and happiness
Collectivistic	Gain	If little concern can protect your family's happiness
Individualistic	Loss	If little neglect can rob your health and happiness
Collectivistic	Loss	If little neglect can rob your family's health and happiness

Effective Frame: Collective + Gain, Individualistic + Loss (S. Korea, USA) Not found in Japan.

Case 5: Addictive behaviors [smoking]

Smoking: combination of framing, intention to quit smoking and nicotine dependence .

Conditions	Frames	Examples
Consequence	Negative	Smoking damages your health and is expensive
	Positive	Quitting smoking improves your health and saves you money
Benefits of quitting smoking	Negative	Smoking gives you bad breath
	Positive	Quitting smoking refreshes your breath
Drawbacks of quitting smoking	Negative	Smoking may keep your weight down, but smoking is a much stronger cause of cardiovascular diseases than a few extra pounds
	Positive	By quitting smoking, you may gain some weight, but to prevent cardiovascular diseases, it is better to have a few extra pounds than to smoke
Self-efficacy issues	Negative	Doubt about whether you can quit smoking can make it harder for you to quit
	Positive	Self-confidence that you will succeed in quitting smoking will make it easier for you to quit

- Given high nicotine dependence and intentions to quit smoking, **negative frame** works better.
- Given low nicotine dependence and intentions to quit smoking, **positive** frame works better.

(Marjolein Moorman and Putte (2008) The influence of message framing, intention to quit smoking and nicotine dependence on the persuasiveness of smoking cessation messages. Addictive Behaviors, 33, 1267-1275)