Information preferences and reference points: experimental evidence

Noemi Peter
University of Groningen

Mark van Oldeniel
University of Groningen

Section 1

Introduction

Information preferences

▶ Emerging new literature highlights that individuals have preferences over when/how to receive information.

▶ Understanding information preferences is important for decisions about information provision. E.g. what is the best way to communicate about developments regarding a war or business or pandemic?

▶ Recent experiments show that information preferences can depend on various factors.

  ▶ E.g. on presentation format (Nielsen, 2020, compound lottery or information structure), on skewness and priors (Masatlioglu et al, 2017), on the presence of assigned distractions

▶ We relate information preferences to theories about reference points, and investigate preferences under gain-loss framing

Reference points

- ▶ Kahneman and Tversky (1979): individuals evaluate outcomes in terms of gains and losses compared to some reference point
- ▶ But what determines the reference point?
  - ▶ Status quo (e.g. Thaler, 1985)
  - ▶ Expectations (Kőszegi and Rabin, 2006, 2009)
- ▶ We test the predictions of different models experimentally in the context of information preferences
  - ▶ Kőszegi and Rabin (2009) explicitly highlight information preferences as an important field of application
  - ▶ Thaler (1985) on hedonic editing: canonical examples such as the Christmas present story can be interpreted as examples of information preferences

What do we do?

- We conduct an experiment that investigates two questions about information preferences, in both the gain and loss domain:
    - Do people prefer clumped or piecewise information?
    - Do people prefer sooner or later information?
- Different theories have different predictions, we put these to the test

Experimental design in a nutshell

▶ All subjects participate in two identical lotteries
▶ The choice is always about receiving **information**. The lotteries are carried out independently of the info choice.

2x2 design

Gain lotteries	Loss lotteries
Choice: clumped or piecewise info	Choice: clumped or piecewise info
Gain lotteries	Loss lotteries
Choice: sooner or later info	Choice: sooner or later info

▶ Sooner-Later conditions allow us to distinguish preferences for clumping information from the preference to learn information sooner

Our design tests several theoretical predictions

▶ Prospect theory with status quo reference point (Kahneman and Tversky, 1979; Thaler, 1985):
  ▶ people want to segregate information about gains but they want to integrate information about losses

▶ Kőszegi and Rabin (2009), expectation-based reference points, agents loss-averse in belief fluctuations:
  ▶ irrespective of the frame, loss-aversion makes subjects prefer clumped information and sooner information

▶ Ely, Frankel and Kamenica (EFK, 2015), agents enjoy suspense, find piecewise info entertaining/exciting
  ▶ irrespective of the frame, subjects prefer piecewise information

Our contributions: three angles

▶ We add new empirical results to the info pref literature, in both gain and loss domains
▶ We are the first to test preferences behind the hedonic editing hypothesis directly with real choices in an experiment
  ▶ Previous studies hypothetical (Thaler, 1985; Thaler and Johnson, 1990) or observational data without randomization (Lim, 2006; Lehenkari, 2009)
▶ We are the first to contrast and test the predictions of status-quo-based and expectations-based models in the context of information preferences
  ▶ Other studies look at different contexts, e.g. exchange (Ericson and Fuster, 2011; Cerulli-Harms 2019), effort provision (Abeler et al 2011; Gneezy et al 2017), choices between risky options (Baillon et al 2020)
  ▶ Zimmermann (2014) and Falk and Zimmermann (2017) focus on Kőszegi and Rabin's model, do not consider status-quo-based reference points

Section 2

Experimental design

Lotteries

Recall: 2x2 design

Gain lotteries	Loss lotteries
Choice: clumped or piecewise info	Choice: clumped or piecewise info
Gain lotteries	Loss lotteries
Choice: sooner or later info	Choice: sooner or later info

▶ Gain lotteries
  ▶ 4 euro with 90% chance, 22 euro with 10% chance
  ▶ Two lotteries, hence 44 euro with 1% chance, 26 euro with 18% chance, 8 euro with 81% chance
▶ Loss lotteries: 52 euro starting balance
  ▶ -22 euro with 90% chance, -4 euro with 10% chance
  ▶ Two lotteries, hence -8 euro with 1% chance, -26 euro with 18% chance, -44 euro with 81% chance
  ▶ Together with starting balance, 44 euro with 1% chance, 26 euro with 18% chance, 8 euro with 81% chance

Information options

Recall: 2x2 design

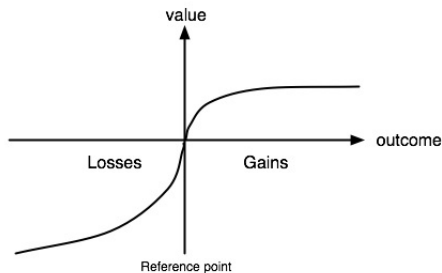| Gain lotteries	Loss lotteries
Choice: clumped or piecewise info	Choice: clumped or piecewise info
Gain lotteries	Loss lotteries
Choice: sooner or later info	Choice: sooner or later info

► Clumped or Piecewise conditions:
  ► Clumped: learn the total gain/loss on the 1st day after the experimental session (Clumped1)
  ► Piecewise: learn the gain/loss from lottery 1 on 1st day and from lottery 2 on 2nd day
► Sooner or later conditions:
  ► Sooner: learn the total gain/loss on the 1st day after the experimental session (Clumped1)
  ► Later: learn the total gain/loss on the 2nd day after the experimental session (Clumped2)

Section 3

Predictions

Kahneman and Tversky + Thaler (KT+T)

▶ S-shaped value function

▶ Concave for gains → segregation is preferred
▶ Convex for losses → integration is preferred
▶ Probabilities of lotteries & probability weighting
▶ Time preferences

Kahneman and Tversky + Thaler: summary of predictions

	Predictions about choices in the CP versus SL treatments
KT+T	Gain: The fraction of subjects choosing Clumped1 is higher in the SL treatments
	Loss: The fraction of subjects chooising Clumped1 is higher in the CP treatments

Kőszegi and Rabin (2009) (KR)

▶ Utility from consumption and from changes in beliefs about present and future consumption

▶ Agents are loss averse in belief fluctuations → preference for clumped information (Proposition 1)

▶ News about more imminent consumption is felt (weakly) more heavily → (weak) preference for sooner information (Proposition 2)

Summary of predictions

	Predictions about choices in the CP versus SL treatments
KT+T	Gain: The fraction of subjects choosing Clumped1 is higher in the SL treatments Loss: The fraction of subjects chooising Clumped1 is higher in the CP treatments
KR	The fraction of subjects choosing Clumped1 is higher in the CP treatments

EFK: Ely, Frankel and Kamenica (2015)

- ▶ People derive entertainment utility from suspense
- ▶ Obtaining information piece by piece is entertaining/exciting→ preference for piecewise info
- ▶ The model assumes that utility is the same irrespective of the timing of information → we can expect subjects to randomize between sooner/later

Summary of predictions

	Predictions about choices in the CP versus SL treatments
KT+T	Gain: The fraction of subjects choosing Clumped1 is higher in the SL treatments Loss: The fraction of subjects chooising Clumped1 is higher in the CP treatments
KR	The fraction of subjects choosing Clumped1 is higher in the CP treatments
EFK	The fraction of subjects choosing Clumped1 is higher in the SL treatmetns

Section 4

Results

Percentage choosing Clumped1
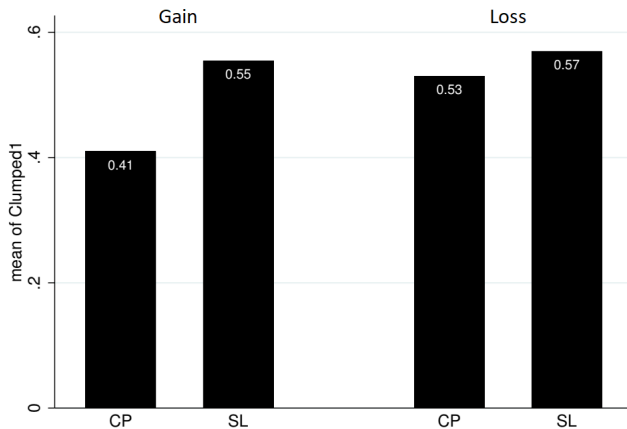
Probit regression results by gain and loss frame

	(1) Clumped1	(2) Clumped1	(3) Clumped1	(4) Clumped1	(5) Clumped1	(6) Clumped1
GainCP	-0.364** (0.178)	-0.373** (0.182)				
LossCP			-0.101 (0.178)	-0.102 (0.183)		
CP					-0.232* (0.126)	-0.230* (0.128)
Constant	0.137 (0.125)	0.438 (0.973)	0.176 (0.126)	0.291 (1.398)	0.157* (0.089)	0.260 (0.810)
Gain or Loss	Gain	Gain	Loss	Loss	Both	Both
Observations	201	201	200	200	401	401
Controls	No	Yes	No	Yes	No	Yes

Probit estimates, robust standard errors in parentheses. Controls include age, a male dummy, dummies for the main study fields and weekday dummies.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Pooled CP and pooled SL

▶ Pooled CP: 47% chose Clumped1 over Piecewise. This share is not significantly different from 50% (binomial test, p=0.44). Thus, neither KR nor EFK gets support

▶ Pooled SL: 56% preferred Clumped1 over Clumped2. This is different from 50% at 10% level (binomial test, p = 0.09). In line with KR, but would be difficult to explain how their model can drive the time preference result but have no discernible impact on clumped-piecewise choices.

Conclusions

▶ In gain domain, segregation is preferred. This supports status-quo-based prediction of Thaler (1985). But no clear preference to integrate losses

▶ Neither Kőszegi and Rabin's expectations-based model, nor EFK's entertainment model is supported by overall patterns

▶ New empirical results added to the information preferences literature

Thank you for your attention!