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Information preferences, reference points and hedonic editing: experimental evidence

Noemi Peter and Mark van Oldeniel

University of Groningen, EEF, P.O. Box 800, Groningen 9700 AV, The Netherlands
Corresponding author: Noemi Peter; Email: a.n.peter@rug.nl

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Abstract

We experimentally investigate preferences for clumping-versus-separating information in the gain and the loss domains, and also preferences for timing. Our design is motivated by the idea that information preferences may depend on reference points. Subjects participate in two monetary lotteries and choose how to receive the outcome information. For half of the subjects, the lotteries are framed as two gain lotteries; for the other half, as two loss lotteries. Based on Thaler (1985) one can expect that people want to learn the outcomes of the gain lotteries separately and the outcomes of the loss lotteries clumped together (cf. hedonic editing hypothesis). On the other hand, a different reference dependent model by Koszegi and Rabin (2009) relies on expectations-based reference points, and predicts that subjects should prefer clumped information irrespective of the frame.

The results of our experiment show a preference for separating information about gains, and no preference for clumping or separating information about losses. Regarding timing, we find a weak overall preference for receiving information sooner. These findings provide new insights into information preferences. We conclude by discussing policy implications, as well as our additional contributions to related literature.

Keywords: Hedonic editing hypothesis; information preferences; lab experiment; reference points

JEL Codes: C91; D83; D90

1. Introduction

What is the best way to provide information to people? Do people prefer to receive information piece by piece or all at once? Do they prefer sooner or later information? Does the answer to these questions depend on whether the information concerns gains (positive events) or losses (negative events)? These questions are important not only because they refer to foundations of behavior, specifically preferences, but also because information provision is an essential task in numerous contexts. For example, policymakers need to inform the public about the benefits and costs of policies, managers need to update employees about bonus amounts or the extent of budget cuts, and researchers need to communicate information about payments to participants in experiments. Understanding how people prefer to receive information facilitates the design of communication strategies that align with those preferences. This could help information providers such as policymakers, managers, and researchers enhance public acceptance, employee motivation, and participant engagement within their respective contexts.

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To study information preferences, we conduct a lab experiment that investigates whether people prefer to receive information clumped or piecewise, and whether they prefer to receive information sooner or later. We examine these questions in both the gain and loss domains. A lab experiment is particularly well-suited for this investigation, as it allows us to carefully control the framing, timing, and format of information, and keeps participants' focus on their choice options.

In terms of theoretical background, the main motivation for our design was to examine how well different reference-dependent models can explain information preferences. Specifically, when designing the experiment, we had two reference-dependent theories in mind: the expectations-based model of Koszegi and Rabin (2009), and an adaptation of the status quo-based hedonic editing hypothesis of Thaler (1985). Previous information experiments considered only Koszegi and Rabin (2009) as a reference-dependent model (see e.g. Falk and Zimmermann, 2023; Nielsen, 2020; Zimmermann, 2014). Adapting Thaler (1985) to an information experiment is our innovation.

The model of Koszegi and Rabin (2009) builds on the idea that reference points are based on expectations (Koszegi and Rabin, 2006), and applies it to the context of information preferences. Koszegi and Rabin (2009) posit that individuals are loss-averse in belief fluctuations. Since piecewise information exposes agents to more belief fluctuations than clumped information, their model predicts a general aversion to receiving information in a piecewise fashion.[1] The experimental literature found mixed results regarding this prediction: studies tend to find a preference for piecewise revelation when information is about positive events (e.g.Kocher et al., 2014; Nielsen, 2020), no preference in mixed gain-loss environments (Zimmermann, 2014), and an aversion to piecewise information in case of a negative event (Falk and Zimmermann, 2023). These mixed findings motivated us to consider an alternative reference-dependent hypothesis, leading to our adaptation of Thaler (1985) to the context of information preferences.

Thaler (1985)'s hedonic editing hypothesis is a status-quo based reference dependent theory. The key ideas of the hedonic editing hypothesis are that individuals prefer the segregation of gains and the integration of losses. The canonical example for segregating gains is wrapping Christmas presents in separate boxes rather than in a single one. We reinterpret this story as reflecting assumptions about information preferences: the provider (the gift giver) organizes information in a certain way (wraps presents in separate boxes) based on assumptions about the receiver's preferences (the assumption being that in the gain domain, separate boxes are preferred due to a desire for segregation). Thus, we link preferences for segregating gains and integrating losses to how individuals prefer to receive information: piecewise in the gain domain and clumped in the loss domain.

We developed a design with which we can test the predictions of Koszegi and Rabin (2009) and Thaler (1985) within the same experiment. Since both reference-dependent models make specific predictions about clumped-versus-piecewisepreferences, our primary focus is on this type of information preferences. Subjects participate in two monetary lotteries which are framed either as two gain lotteries or as two loss lotteries. They must choose how they want to be informed about the outcome of the two lotteries. In addition to varying the frame, we cross-randomize the available information options (2x2 design). In our Clumped-Piecewise conditions, subjects can either learn the combined outcome of the two lotteries the day after the experimental session, or learn the outcome of one lottery the day after the session and the outcome of the other lottery the second day after the session. Choosing piecewise information implies not only separate learning of outcomes but also a delay in learning the second outcome, so clumped-piecewise choices also depend on sooner-later preferences. We use Sooner-Later conditions to capture such preferences, where subjects choose between learning the combined outcome sooner (the day after the session) or later (the second day after the session). To assess whether preferences for clumping versus separating information are significant drivers of

[1]Other theories by Palacios-Huerta (1999) and Dillenberger (2010) also predict an aversion to piecemeal information in our setting. Furthermore, Gul et al. (2021) can potentially generate such preferences depending on parameter values. See Section 2.1 for a discussion of these theories.

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behavior beyond preferences over timing, we compare choice shares in the Clumped-Piecewise conditions to those in the Sooner-Later conditions. This strategy follows Falk and Zimmermann (2017); Falk and Zimmermann (2023). While Falk and Zimmermann (2017); Falk and Zimmermann (2023) study information preferences only for a negative event (receiving an electric shock), we use a gain-loss framing to have both a Gain and a Loss treatment. This enables us to test the predictions of Thaler (1985) for both the gain and the loss domains. Importantly, we can also contrast Thaler (1985) and Koszegi and Rabin (2009), as they make opposite predictions for clumped-versus-piecewise preferences in the gain domain.

In addition to the two reference-dependent models, our design also allows us to test a non-reference-dependent model that makes a distinct prediction about preferences for clumped versus piecewise information: Ely et al. (2015). Ely et al. (2015) assume that individuals derive utility from suspense, implying that receiving information piece by piece is attractive because it can increase entertainment and excitement. This prediction is general. Hence, in our experiment the prediction of Ely et al. (2015) for clumped-versus-piecewise preferences is the opposite of that of Koszegi and Rabin (2009) and distinct from the predictions of the status quo-based hedonic editing hypothesis.

Our results reveal a preference for piecewise information in the gain domain, but no clear preference regarding information about losses. When pooling data across frames, the preference for piecewise information is weakly significant. None of the models are fully supported by these data, but the domain-specific results provide partial support for Thaler (1985) in that subjects prefer separation in the gain domain, and the pooled results provide weak support for Ely et al. (2015). Regarding timing, we find a weak overall preference for receiving information sooner.

We make contributions in several ways. First, we advance the understanding of information preferences: we provide novel insights by being the first to examine both clumped-piecewise and sooner-later choices under gain-loss framing (section 5 discusses details). Second, we contribute to theory testing, most notably by contrasting the predictions of status quo-based and expectations-based reference-dependent models. By doing so, we bring the debate about the basis of reference points into the information preference literature. Previous studies either focused only on the expectation-based model of Koszegi and Rabin (2009) (Falk and Zimmermann, 2023; Nielsen, 2020;Zimmermann, 2014), or tested different reference-dependent theories in contexts other than information preferences.[2] Third, we connect the ideas behind the hedonic editing hypothesis to a new, incentivized framework, moving beyond the traditional approach that tested these ideas in hypothetical scenarios (Thaler, 1985; Thaler and Johnson, 1990).

The remainder of this paper is structured as follows: section 2 discusses the related background literature, while section 3 elaborates on the experimental design and on the predictions of the different models. Our results are presented in section 4. Section 5 discusses how our results compare to other experimental studies, and section 6 summarizes the main conclusions.

2. Background literature

Our study bridges the literature on information preferences with that on hedonic editing.

2.1. Information preferences

We provide evidence on two dimensions of information preferences: whether individuals prefer to receive information in pieces or clumped together, and whether they prefer sooner or later information. Here we give a brief overview of studies focusing on these dimensions. For a broader literature review, we refer the reader to Golman et al. (2017).[3]

[2]For example, in the context of effort provision (Abeler et al., 2011; Gneezy et al., 2017), exchange (Cerulli-Harms et al., 2019; Ericson and Fuster, 2011; Heffetz and List, 2014) and choices between gambles (Baillon et al., 2020).

[3]For skewness, which is another dimension of information preferences, see Masatlioglu et al. (2023).

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Theoretical, clumped-versus-piecewise: From this literature, a key motivation for our experimental design was the expectation-based reference-dependent model of Koszegi and Rabin (2009). Koszegi and Rabin (2009) posit that changes in beliefs about consumption affect utility, and that individuals are loss averse in belief fluctuations. They predict that individuals dislike receiving information piece by piece due to their aversion to fluctuations. Two closely related models are Palacios-Huerta (1999) and Dillenberger (2010). These models focus on one-shot versus gradual resolution of uncertainty, and posit a preference for one-shot resolution. Palacios-Huerta (1999) derives this preference from disappointment aversion based on Gul (1991), while Dillenberger (2010) links it to preferences for certainty over simple outcomes. In our experimental setting, these models imply a general preference for clumped information. Since this prediction coincides with that of Koszegi and Rabin (2009), we use Koszegi and Rabin (2009) to represent theories predicting aversion to piecemeal information; evidence consistent or inconsistent with this prediction in our experiment therefore also bears on these related models.

In contrast, Ely et al. (2015) propose a model that makes the opposite prediction. Ely et al. (2015) assume that individuals derive utility from suspense and therefore receiving information piece by piece is beneficial as it can increase entertainment and excitement. Ely et al. (2015) mention casino gambling as illustration, where part of the fun is the suspense and surprise resulting from anticipating and then observing each separate dice roll, card flip or spin of the wheel. We discuss and analyze Ely et al. (2015) separately since its prediction for clumped-piecewise preferences contrasts with the other models.

Finally, Gul et al. (2021) model random evolving lotteries as choice objects and allow preferences for one-shot versus gradual resolution to depend on peak–trough utility parameters, where peaks (troughs) refer to the best (worst) lottery along a path. We do not focus on this model in our main analysis as it allows for various predictions depending on the parameters.

Theoretical, sooner-versus-later: The model by Koszegi and Rabin (2009) is also applicable to sooner-later choices: it predicts a weak preference for sooner information (see details in section 3.1). Furthermore, a broader array of theories applies to sooner-later choices as this topic has the longest tradition in the literature. Studies such as Kreps and Porteus (1978), Epstein and Zin (1989) and Grant et al. (1998) specify conditions under which utility functions represent preferences for one or the other timing. The literature also highlights various motivations for preferring early or late information. For example, Brunnermeier and Parker (2005) points out that late information is attractive in that it allows people to remain optimistic for longer about uncertain events. Loewenstein (1987) focuses on anticipation and shows that people want to delay pleasurable events to savor positive anticipation, but move forward averse events to reduce the dread associated with contemplating the future.[4] These considerations underscore the relevance of the Sooner-Later treatments in our design and the importance of using Sooner-Later results to benchmark Clumped-Piecewise results.

Experimental: Recent literature increasingly uses experiments to study information preferences (e.g.Brown & Kim, 2013; Falk and Zimmermann, 2017; Falk and Zimmermann, 2023; Ganguly and Tasoff, 2017; Kocher et al., 2014; Masatlioglu et al., 2023; Nielsen, 2020; von Gaudecker et al., 2011; Zimmermann, 2014).[5] Notably, experiments in the gain domain tend to indicate a preference for piecewise information (e.g. Kocher et al., 2014; Nielsen, 2020), while the opposite holds when information is about a negative event (Falk and Zimmermann, 2017; Falk and Zimmermann, 2023). We will discuss the findings of this literature in more detail in section 5, where we compare them to our results.

[4]Further theoretical work on the role of anticipation and beliefs include Caplin and Leahy (2001); Caplin and Leahy (2004), Epstein (2008), Pagel (2018), Golman et al. (2021b), Bénabou (2013).

[5]There is also an earlier literature that is based on non-incentivized, hypothetical choices (Ahlbrecht and Weber, 1996; Ahlbrecht and Weber, 1997; Arai, 1997; Chew and Ho, 1994; Lovallo and Kahneman, 2000).

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2.2. Hedonic editing hypothesis, status-quo reference point

The hedonic editing hypothesis of Thaler (1985) builds on prospect theory, the reference-dependent theory of Kahneman and Tversky (1979), which was further elaborated in Tversky and Kahneman (1992). Kahneman and Tversky (1979) argued that the reference point "usually corresponds to the current asset position", i.e. the status quo (Kahneman and Tversky, 1979, p. 274). They also argued that the reference point creates an inflection point, leading to an S-shaped value function that is convex for losses and concave for gains. Subsequently, Thaler (1985) posited that people prefer the segregation of gains and integration of losses, using the S-shaped value function as theoretical underpinning. These preferences later became known as principles behind the hedonic editing hypothesis (Thaler and Johnson, 1990).[6]

Thaler (1985) tested his hypothesis with hypothetical examples of gains and losses. Subjects had to decide which hypothetical person was happier: person A, who experienced two events, or person B, who experienced one financially equivalent event. For example, participants read that person A won \$50 in one lottery and \$25 in another, while person B won \$75 in a lottery. Thaler (1985) found that when subjects assessed these hypothetical scenarios, they expressed a preference for separating gains and integrating losses.

Further hypothetical experiments supported Thaler's hypothesis only partially.[7] Thaler and Johnson (1990) asked subjects to choose whether they wanted two hypothetical events to occur on the same day or on different days, and in another study they asked participants for incremental subjective assessments.[8] Some of the questions recycled examples from Thaler (1985). For example, they stated that both A and B win \$50 in one lottery and \$25 in another, but A wins the two lotteries on the same day while B wins one lottery on one day and the other two weeks later. Thaler and Johnson (1990) found that respondents preferred the segregation of gains but not the integration of losses. Similarly, Linville and Fischer (1991) asked subjects whether they would like to temporally separate two hypothetical events and found that subjects preferred to separate not only two positive events but also two negative events. Evers et al. (2021) argue that the negative events in previous work may have been too dissimilar to integrate (e.g. a bad grade and a serious argument with a friend) and show that subjects want to time similar losses close to each other but not dissimilar losses.

We bridge this literature with that on information preferences by adapting Thaler's hypothesis to information preferences and testing its main ideas in an information experiment. Instead of using hypothetical scenarios, we conduct real lotteries which we frame either in terms of gains or in terms of losses. Participants choose how they want to be informed about the outcomes, allowing us to investigate their information preferences. We translate Thaler's ideas to this context as the following hypothesis: piecewise information is preferred about gains and clumped information about losses. We argue that this is a straightforward, relatively close adaptation of his work, especially considering the hypothetical lottery examples in Thaler and Johnson (1990).[9] Our adaptation builds on the notion that how we receive information affects how we feel. We can conceptualize this such that if information about outcomes arrives in a piecewise (clumped) fashion, the outcomes enter the value function in a segregated (integrated) way. This conceptualization makes a clear connection between segregation-integration and clumped-piecewise preferences: in domains where subjects prefer segregation (integration), they should prefer piecewise (clumped) information. Note that we avoid the

[6]We use the word "editing" since it has become common in the literature, but we note that Thaler (1985) focused more on how others can best organize options for people, not on how people edit (mentally code) options.

[7]Studies on the timing of sales by stock market investors also show mixed support for Thaler's hypothesis (Lim, 2006; Lehenkari, 2009). These studies use non-experimental settings which do not provide sufficient control to exclude the influence of confounding factors.

[8]In addition to examining preferences for segregation/integration, Thaler and Johnson (1990) also conducted experiments on the effect of prior outcomes on risky choices. See also Arkes et al. (1994) on the psychology of windfall gains.

[9]A more distant example of applying insights from prospect theory to the information context is Litovsky et al. (2022), who build a theoretical analogy between information and objects and focus on losing and gaining information itself.

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Table 1. Summary of 2x2 experimental design

	Gain framing		Loss framing	
Clumped-Piecewise (CP)	Lotteries:	win 4 or 22 in each	Lotteries:	lose 22 or 4 in each
	Option Y:	Piecewise	Option Y:	Piecewise
Sooner-Later (SL)	Lotteries:	win 4 or 22 in each	Lotteries:	lose 22 or 4 in each
	Option Y:	Clumped2	Option Y:	Clumped2

Note: In each treatment subjects take part in two monetary lotteries, which are framed as lotteries over gains (losses) in the Gain (Loss) treatments. Irrespective of the framing, the final payoffs are the same as subjects get a starting balance in the Loss frame. Subjects choose between information options X and Y. Option X is Clumped1 in all treatments, which means learning the combined outcome of the two lotteries on Day 1. Option Y varies between the Clumped-Piecewise treatments and the Sooner-Later treatments. Piecewise means learning the outcome of one lottery on Day 1 and the outcome of the other on Day 2. Clumped2 means learning the combined outcome of the two lotteries on Day 2.

dissimilarity problem mentioned by Evers et al. (2021) by using two identical loss lotteries in our experiment. Further details on the experimental design and predictions are provided in the next section.

3. Experimental design

Our experiment has a 2x2 between-subject design and hence we have four treatment groups. In each treatment, subjects take part in two monetary lotteries. These two lotteries are identical and are carried out independently of each other. Each lottery has two potential outcomes, which are framed either as gains or as losses. Subjects have to choose how they want to get informed about the outcomes of the two lotteries and can choose between option X and option Y.

In all treatments, option X is Clumped1, which means that the subject will learn the outcomes of the two lotteries combined together on the day after the experimental session. Option Y varies across treatments (see Table 1). In the Clumped-Piecewise (CP) treatments, option Y is Piecewise information, which means that subjects learn the outcomes of the two lotteries separately, such that the outcome of the first lottery is shown to them on the first day after the experimental session and the outcome of the second lottery on the second day after the experimental session. In the Sooner-Later (SL) treatments, information is always clumped, but subjects can choose its timing. Specifically, they choose between learning the sum of the two lottery outcomes on the first day after the experimental session (X= Clumped1) or on the second day after the experimental session (Y= Clumped2). The Clumped-Piecewise treatment was inspired by the experimental design of Zimmermann (2014) and Falk and Zimmermann (2017); Falk and Zimmermann (2023) and the addition of the Sooner-Later treatment follows Falk and Zimmermann (2017); Falk and Zimmermann (2023).

To study our primary interest – preferences for clumping versus separating information – it is important to include both CP and SL treatments in the design. In the CP treatments, choosing Piecewise implies not only that subjects receive information separately, but also that they delay learning the outcome of the second lottery. Therefore, CP choices can be affected both by preferences for clumping versus separating information and by preferences for sooner versus later information. In the SL treatments both options deliver clumped information, so SL choices can be driven only by preferences for receiving information sooner or later. Thus, following Falk and Zimmermann (2017); Falk and Zimmermann (2023), we will compare choices in the CP treatments with those in the SL treatments to assess whether preferences for clumping versus separating information are significant drivers of behavior beyond preferences over timing. If a specific preference for clumping (separating) is an important driver of behavior, we should observe a higher (lower) share of Clumped1 choices in CP than in SL. We elaborate further on the theoretical predictions and their connection to the empirical strategy in Section 3.1.

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In addition to the CP-SL variation, we cross-randomized subjects into 'Gain' and 'Loss' conditions (2x2 design, see Table 1). In the Gain framing, the lotteries are described as two gain lotteries. Subjects can win either 4 euros or 22 euros in each lottery. Thus, their eventual payoffs are 8 euros if they win the smaller amount in both lotteries, 26 euros if they win the smaller amount in one lottery and the larger in the other, or 44 euros if they win the larger amount in both lotteries. The eventual payoffs are the same in the Loss conditions, but the framing is different. Recall that Kahneman and Tversky (1979) argued that the initial asset position typically acts as reference point. We manipulate the initial asset position by giving subjects a starting balance of 52 euros in the Loss treatments. The lotteries are then described as loss lotteries, and it is made clear that the losses from the lotteries will be deducted from the starting balance. A subject can lose 22 or 4 euros in each lottery, which means losing 44, 26 or 8 euros in total. Of course, losing these amounts from 52 euros is financially equivalent to winning 8, 26 or 44 euros.[10]

In terms of probabilities, in each lottery the better outcome has a 10% probability and the worse outcome has a 90% probability, irrespective of the framing.[11] This choice is motivated by evidence in Masatlioglu et al. (2017); Masatlioglu et al. (2023). The relevance of this evidence follows from our empirical strategy, which compares choice shares in the CP and SL treatments. If the share choosing Clumped1 in the SL treatments were close to zero or hundred percent, differences relative to the CP treatments would be mechanically constrained by floor or ceiling effects, limiting statistical power. Therefore, it is desirable to choose the probability of the better outcome such that we can expect choice percentages in SL to be close to the midpoint of fifty percent rather than the extremes. Masatlioglu et al. (2017); Masatlioglu et al. (2023) are informative on this because they let subjects choose between early and late information and find that the share choosing early information is closest to the midpoint when the probability of the better outcome is low, hence our choice of 10% probability.[12]

The experiment consists of an experimental session of about half an hour and two small online tasks that subjects have to do on the next two days. Subjects are instructed that they need to complete both the session and the online tasks to get paid. During the experimental session subjects have to choose how they want to be informed about the outcomes of the lotteries. Irrespective of which information option participants choose, the lotteries are conducted privately by the experimenter after the session, on the same day as the session. Participants' choice cannot affect the outcome of the lotteries, it only determines how they will be informed. Before making their choice, subjects are informed about the two online tasks and have to answer test questions correctly.[13] The timeline of the experiment is presented in Table 2.

The online tasks are two small verification tasks that subjects have to perform on an online platform, which could be accessed from home or any location with internet access. On both the first and second day after the experimental session, we post some information on this online platform.

[10]The losses-from-endowment method is commonly used to address the practical constraint that participants cannot leave an experiment with less money than they had at its beginning (see e.g. Harrison & Ng, 2016; Mason et al., 2005). Such designs raise the concern that outcomes may not be perceived as genuine losses. Addressing this issue, Etchart-Vincent and l'Haridon (2011) compare a losses-from-endowment treatment to a treatment without an endowment covering potential losses and find no significant differences in risk-taking, suggesting that endowment losses are perceived similarly to out-of-pocket losses. Relatedly, Engelmann et al. (2024) find similar results in a losses-from-endowment treatment and an electric shock treatment with respect to anticipatory anxiety and wishful thinking. We opted for a monetary losses-from-endowment treatment over a loss treatment in which participants experience a bad such as an electric shock because we wanted to keep the context of our gain and loss treatments similar, and monetary gains and losses offer the cleanest way to achieve this.

[11]Note that since our framing does not change probabilities, skewness (Masatlioglu et al., 2023) and peaks and troughs (Gul et al., 2021; Gul et al., 2022) are the same in the loss and the gain frame. That is, relatively better/worse outcomes are just as likely in the loss frame as they are in the gain frame. The expected earnings are 11.60 euros in both frames.

[12]In contrast to Masatlioglu et al. (2017); Masatlioglu et al. (2023), Falk and Zimmermann (2017); Falk and Zimmermann (2023) find no significant differences when comparing treatments with different probabilities, which suggests that prior probabilities may only matter in the gain domain but not in the loss domain.

[13]If they do not know the answers immediately, they can review the instructions and try again until they get the test questions right.

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Table 2. Timeline of the experiment

Day 0	Day 1	Day 2	Day 3
In the lab	*At home*	*At home*	
Experimental session	Task 1	Task 2	Payment instruction
Make information choice	Verify reading information	Verify reading information	

Depending on the subject's choice in the experiment, this information is either the outcome of one lottery, the outcome of two lotteries, or some unrelated information. The unrelated information is a random letter. If a subject chooses piecewise information, the first task on the first day after the experimental session is to verify that they have read their gain (loss) in the first lottery, i.e. to report the information back to us on the online platform. On the second day, this subject has to verify that they read their gain (loss) in the second lottery. For subjects who chose to receive the outcomes clumped together on the first day (second day), the first (second) task entails verifying that they have read how much they gained/lost in the two lotteries together. On the other day, these subject have to verify that they have read the unrelated information (the random letter) that we posted for them.

Our set-up ensures that subjects actually absorb the information. Furthermore, by requiring that they have to verify some (irrelevant) information also on days when they do not learn anything about the lotteries, we ensure that the workload and its distribution over days is the same irrespective of the subject's choice. The moment of payment was not influenced by the choices of the participants either. On the third day after the experimental session, the experimenter entered the earnings for all participants who successfully completed the two online tasks in the university's automated payment system. Payments went through this payment system in approximately two working days.

Finally, an important design choice worth discussing is that we rely on binary choices between information options, without an explicit indifference option or strength-of-preference elicitation. This reflects a trade-off between simplicity and measurement richness. Binary choices keep participants' focus on the information options and have the simple, deterministic consequence that the chosen option is implemented. Introducing an indifference option or a preference-strength elicitation would require probabilistic implementation (e.g. randomizing which information option is implemented when indifference is selected), which weakens incentives and can introduce confounds. For example, a randomizing indifference option risks conflating true indifference with the avoidance of decision-making, as people can have procedural preferences for delegating decisions to random devices (Dwenger et al., 2019; Sandroni et al., 2013). This concern is particularly relevant in our Clumped – Piecewise treatments, where decisions can involve resolving trade-offs across multiple preference dimensions. For instance, the same subject may prefer sooner information but also piecewise information. We want subjects to think through which of their preferences is stronger and choose accordingly, rather than providing an external device that allows them to avoid making a decision. Furthermore, elicitation tasks that quantify individuals' preference strength also substantially increase cognitive complexity. Beyond the gain or loss lotteries and the information options, participants must also consider additional incentives, understand the elicitation mechanism and map information preferences onto monetary scales. This added complexity increases the scope for misunderstandings and makes behavioral incentive compatibility a concern — one that experimental evidence suggests is nontrivial (e.g. Bohm et al., 1997; Danz et al., 2022; Mamadehussene and Sguera, 2023).

In sum, our design prioritizes simplicity in order to minimize cognitive and procedural complexity and preserve deterministic incentives, at the cost of not being able to identify exactly indifferent individuals or to measure the precise strength of their preferences. We accepted this trade-off because our objective is not to analyze preference heterogeneity, but rather to examine which preference prevails at the aggregate level. Since we cannot identify indifferent subjects, we have to make assumptions

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Table 3. Preferences for clumping versus separating information: Predicted differences in Clumped1 choice shares between CP and SL treatments

Theory	Qualitative prediction	Prediction for the share of subjects choosing Clumped1
T+KT	Gain: Preference for separating Loss: Preference for clumping	Lower Clumped1 choice share in GainCP than in GainSL Higher Clumped1 choice share in LossCP than in LossSL
KR	Preference for clumping	Higher Clumped1 choice share in CP than in SL
EFK	Preference for separating	Lower Clumped1 choice share in CP than in SL

Note: T+KT means Thaler (1985), Kahneman and Tversky (1979) and Tversky and Kahneman (1992). KR means Koszegi and Rabin (2009). EFK means Ely et al. (2015). GainCP and LossCP denote the Clumped – Piecewise treatments with Gain and Loss framing, respectively, and CP pools observations from GainCP and LossCP. Analogously, GainSL and LossSL denote the Sooner – Later treatments with Gain and Loss framing, respectively, and SL pools observations from GainSL and LossSL.

about their behavior; we will assume that on average indifferent subjects choose each option with equal probability, in line with previous literature (Chew and Ho 1994; Falk and Zimmermann 2017; Falk and Zimmermann 2023; Masatlioglu et al. (2023); Alcocer et al. 2020).[14]

3.1. Predictions

This section summarizes the predictions of the three theories highlighted earlier, and the intuition behind them. We provide formal treatments and more details in the Online Appendices.

Recall that our focus is on preferences for clumped-versus-piecewise information, and that we therefore compare choices in the Clumped-Piecewise (CP) conditions to those in the Sooner-Later (SL) conditions, since clumped-piecewise choices can also be driven by sooner-later preferences. Table 3 summarizes the qualitative predictions of the three theories for clumped-versus-piecewise preferences and their implications for the CP versus SL comparison. T+KT stands for Thaler (1985), Kahneman and Tversky (1979) and Tversky and Kahneman (1992), KR stands for Koszegi and Rabin (2009), and EFK stands for Ely et al. (2015). The remainder of this section discusses each theory in turn.[15]

Predictions T+KT: Thaler (1985) posited that people prefer segregation in the gain domain and integration in the loss domain, and used the S-shaped value function of prospect theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992) to underpin this hypothesis. Indeed, with a value function that is concave for gains and convex for losses, people always prefer to segregate sure gains and integrate sure losses. Instead of sure amounts our experiment involves potential outcomes in lotteries, so we also need to incorporate probabilities as we apply the hypothesis to our setting. Therefore, in Online Appendix A.1 we show that thanks to the properties of concave (convex) functions, the conclusions do not change when probabilities are incorporated: segregation (integration) is still preferred in the gain (loss) domain.

As an additional step, we also considered what happens if probability weights are used instead of plain probabilities. To be clear, we do not find it likely that subjects engage in probability weighting, especially since our instructions explain probability relations (e.g. that 10%*10%=1%). Nonetheless, since Tversky and Kahneman (1992) included probability weights in prospect theory,

[14] Alcocer et al. (2020) document a behavioral tendency to randomize uniformly in case of indifference. Studying games with mixed equilibria, they find that when subjects are indifferent between several optimal choices, many randomize uniformly rather than using the probabilities required by the Nash equilibrium. Moreover, results from experiments closest to ours are consistent with our assumption and suggest that indifference is relatively uncommon (Masatlioglu et al. (2023) treatment 1 of experiment 3; Falk and Zimmermann 2017; Falk and Zimmermann 2023)

[15] Recall from section 2.1 that similarly to Koszegi and Rabin (2009), Palacios-Huerta (1999) and Dillenberger (2010) also predict a preference for clumping in our setting and therefore results on this prediction also bear on these models. Furthermore, depending on parameter values, Gul et al. (2021) could generate a preference for clumping like Koszegi and Rabin (2009) or for separating like Ely et al. (2015).

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in Online Appendix A.1 we verify that the predictions are robust for potential probability weighting (i.e. they hold when probability weights are added with reasonable parameter values from the literature).

Regarding sooner-later preferences, Thaler (1985) does not make predictions as he abstracts away from timing considerations. This abstraction is explicit in Thaler and Johnson (1990): subjects are instructed not to think about the sooner-later issue when making their hypothetical choice.[16] As our experiment relies on actual rather than hypothetical choices, we cannot abstract away from potential sooner-later preferences and therefore compare clumped-piecewise choices to sooner-later choices. This does not mean that we assume indifference with respect to sooner-later choices. On the contrary, we allow for sooner-later preferences to be present and use the SL treatments as a benchmark to avoid wrongly attributing patterns that are driven by sooner-later preferences to Thaler's hypothesis. For the sake of illustration, let us suppose that T+KT does not drive choices, but subjects have preferences for timing as in Loewenstein (1987): they prefer later information about gains and sooner information about losses. These preferences would lead them to choose Clumped1 in both LossCP and LossSL, and the alternative in both GainCP and GainSL. If we were to examine CP choices in isolation, without comparison to SL choices, we would erroneously attribute the results to preferences for segregating gains and integrating losses, concluding that there is support for T+KT when in fact choices are driven by time preferences.

In sum, T+KT does not make predictions for the SL treatments, and we need to use these treatments as a benchmark. Since T+KT predicts separation in the gain domain and clumping in the loss domain, this theory implies that subjects should be less likely to choose Clumped1 in GainCP than in GainSL, and more likely to choose Clumped1 in LossCP than in LossSL.[17]

Predictions KR: In the model of Koszegi and Rabin (2009) utility is affected by belief changes and beliefs are based on rational expectations. Gain-Loss framing should not matter because subjects in the Gain and Loss treatments can expect the same payoffs. Beliefs change every time there is new information, so piecewise information causes more belief fluctuations than clumped information. Koszegi and Rabin (2009) assume that individuals are loss averse in belief changes and hence they dislike belief fluctuations in expectation. This implies that they prefer clumped information. This key result is captured in Proposition 1 of Koszegi and Rabin (2009) and it is directly applicable to our experiment (see Online Appendix B for a formal treatment).[18]

Furthermore, Koszegi and Rabin (2009) assume that news about more imminent consumption is felt at least as heavily as news about more distant consumption. This implies that it is weakly better to receive information sooner rather than later, because the negative impact of belief fluctuations is smaller (or at least not larger) when the time gap between information and consumption is larger. Thus, according to Koszegi and Rabin (2009) there should be a weak preference for sooner information. This key result is captured in Proposition 2 of their paper and it is also directly applicable to our experiment (see Online Appendix B).

In sum, Koszegi and Rabin (2009) predict that in the SL treatments Clumped1 is chosen at least as frequently as Clumped2 because of a weak preference for sooner information. Crucially, Koszegi

[16]Specifically, the instructions of Thaler and Johnson (1990) (p. 649) include the following note: "Having the events occur together does not imply that they occur sooner or later than if they were apart. That is not the question. You are only asked to judge whether it is better to have the events separately or together."

[17]These predictions rely on having both a status-quo reference point and diminishing sensitivity. In Appendix A.1 we show that with a status-quo reference point and linearity instead of diminishing sensitivity, subjects are indifferent between separation and integration. In Appendix A.2 we show that if the reference point is the expected value rather than the status quo, subjects in our experiment should prefer integration irrespective of the framing.

[18]There is an interesting similarity between Appendix B and the example in Appendix A.2. In both cases, results are derived for a piecewise linear function with expectation-based reference points, and in both cases the prediction is that subjects prefer clumped information irrespective of framing. The intuition is that in both cases integration allows subjects to cancel bad news with good news.

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and Rabin (2009) also predict an aversion to piecemeal information. Thus, in the CP treatments there are two motives to choose Clumped1: a weak preference for sooner information and a strong preference for clumped information. If the key prediction of aversion to piecemeal information holds, we should observe that Clumped1 is chosen more frequently in the CP treatments than in the SL treatments.

Predictions EFK: The model of Ely et al. (2015) is relevant for us because it assumes that individuals enjoy suspense (e.g. they find it entertaining or exciting). A period is more suspenseful if the variance of the next period's belief is higher. In the framework of this model, strictly concave utility over suspense implies a preference for spreading suspense over periods rather than clumping it into a single period. Therefore, the model predicts a preference for piecewise information. Ely et al. (2015) do not distinguish between a gain and a loss domain and hence this prediction is general. Ely et al. (2015) largely abstracts away from issues surrounding time preferences and therefore we treat it as not delivering a prediction regarding sooner-later choices. As in the T+KT case, we thus use the Sooner–Later condition simply for benchmarking. Since the model postulates a general preference for piecewise information, its prediction is that Clumped1 should be chosen less frequently in CP than in SL. See Online Appendix C for a more formal treatment.

Predictions overall: The predictions in Table 3 are directional and concern differences in choice shares between the relevant CP and SL treatments. This reflects our empirical strategy, which assesses whether preferences for clumping versus separating information systematically influence behavior beyond preferences over timing. Since our design relies on binary choices, we cannot measure preference strength at the individual level and cannot identify heterogeneity. Consequently, if opposing information preferences coexist in the population (e.g. some subjects prefer piecewise information as predicted by Ely et al. (2015), while others prefer clumped information as predicted by Koszegi and Rabin (2009)), they may offset each other in the aggregate. While this limits the richness of what we can detect, identifying which prediction prevails in the aggregate choice data is meaningful in its own right. Understanding the information preferences of the relative majority is directly relevant for the design of communication strategies; it is particularly crucial in situations when information needs to be provided uniformly because tailoring it to different subgroups would be infeasible or difficult to justify.

4. Results

We ran our experiment in the Groningen Experimental Economics Laboratory (GREELab) in spring and fall 2019.[19] We invited students from the GrEELab subject pool, and since those were typically undergraduates from campus, the main study fields in the sample are science and engineering, economics and econometrics, and spatial sciences.[20] A total of 401 subjects participated in 32 sessions (spread over 11 days). The average age was about 20 years. To ensure that participants did not have to do any tasks over the weekend, we ran the sessions on Mondays, Tuesdays and Wednesdays. Online Appendix Table D1 shows descriptive statistics and demonstrates that the distribution across treatment groups is balanced.

Figure 1 shows the share of subjects who chose to learn the outcome of the two lotteries clumped together on day 1 (Clumped1) for the four treatments. There is a remarkable contrast between the GainCP condition and the rest. In the GainCP condition, only 41% of the subjects choose Clumped1,

[19]GrEELab experiments are incentivized and do not use deception. The GrEELab committee approved the project and its funding (GrEELab project GR19-02), and IRB review was conducted under IRB reference number FEB-20190301-7822.

[20]The GrEELab subject pool does not include psychology and business students. As a further precaution, we did not invite third-year students of economics and econometrics, who could have taken our behavioral and experimental economics course.

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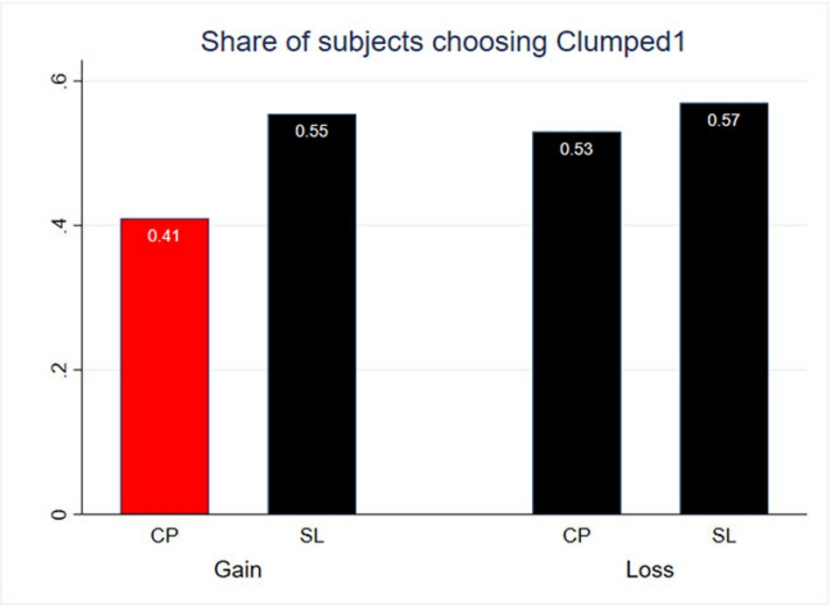


Fig. 1 Share of subjects choosing Clumped1, per treatment condition
Note: Share of subjects choosing Clumped1 in the four treatment conditions. In the CP conditions, subjects chose between Clumped1 and Piecewise, and in the SL conditions, subjects chose between Clumped1 and Clumped2

while in the other conditions this share fluctuates around 55%.[21] This first look at the choice patterns does not reveal full support for either theory, but it indicates partial support for Thaler (1985) in that people seem to have a preference for the segregation of gains. In the next subsections we analyze the choice patterns more formally.

4.1. Preferences for receiving information clumped or piecewise

To examine preferences for separating versus clumping information, we need to compare choices in the CP treatments to choices in the SL treatments. Table 4 reports the results of OLS regressions. In all regressions, the dependent variable is the choice of Clumped1. In columns (1) and (2) we focus on choices in the Gain treatments, in columns (3) and (4) on the Loss treatments, and in columns (5) and (6) we look at the pooled data.

In columns (1) and (2) we see that Clumped1 is chosen significantly less often in the GainCP condition than in the GainSL condition, confirming the prediction of Thaler (1985) that segregation (i.e. piecewise information) is preferred in case of gains. In columns (3) and (4), the share of subjects choosing Clumped1 in the LossCP treatment is compared to the share in the LossSL treatment. While based on Thaler (1985) we expected a positive and significant coefficient, the estimates in columns (3) and (4) are negative and insignificant. Thus, overall we see a partial alignment with Thaler (1985): a preference for segregating gains, but no preference to integrate losses.[22]

[21] Upon suggestion, we checked the percentages without students of economics and econometrics and found again a clear contrast. Specifically, in the GainCP condition 38% chose Clumped1, while in all of the three other conditions the share was exactly 50%.

[22] Upon suggestion, we also looked into heterogeneity by gender. We found that the point estimates are in the same direction for men and women, with the preference for segregating gains being particularly strong among women. Neither men nor women prefer to integrate losses.

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Table 4. OLS regressions comparing CP treatments to SL treatments

	(1) Clumped1	(2) Clumped1	(3) Clumped1	(4) Clumped1	(5) Clumped1	(6) Clumped1
GainCP	-0.144**	-0.145**				
	(0.070)	(0.071)				
LossCP			-0.040	-0.036		
			(0.071)	(0.069)		
CP					-0.092*	-0.090*
					(0.050)	(0.050)
Gain or Loss	Gain	Gain	Loss	Loss	Both	Both
Observations	201	201	200	200	401	401
Controls	No	Yes	No	Yes	No	Yes

Notes: The table shows OLS estimates with robust standard errors in parentheses. Controls include age, a male dummy, dummies for the main study fields and weekday dummies. **p$<$ 0.05, *p$<$ 0.1

Since Koszegi and Rabin (2009) and Ely et al. (2015) do not distinguish domains, in columns (5) and (6) we show results when data from the Gain and the Loss treatments are pooled. In these regressions CP is a dummy equal to 1 if a subject was in one of the two Clumped-Piecewise treatments. In these pooled data the negative coefficient of Clumped1 is significant at the 10% level. This is opposite of the prediction by Koszegi and Rabin (2009). As for Ely et al. (2015), the pooled result is in line with their prediction, though it is only weakly significant. From the previous columns and from Figure 1 it seems that the result is driven primarily by choices in the Gain treatments, while the prediction of Ely et al. (2015) is not specific to this domain. To explore this further we checked the difference-in-difference estimate and found that subjects are indeed more likely to prefer piecewise information in the gain domain than in the loss domain (untabulated OLS result, significant at the 10% level).

4.2. Preferences for receiving information sooner or later

As discussed in section 2.1, much of the existing literature focuses on sooner-later preferences, and our design allows us to contribute also to this area of research. First, we investigate sooner-later preferences when data from the gain and loss conditions are pooled. Recall from section 3.1 that Koszegi and Rabin (2009) makes predictions for preferences for timing irrespective of domains. Specifically, they argue that there should be a weak preference for sooner information. We find that about 56% of subjects preferred Clumped1 over Clumped2 in the pooled GainSL-LossSL data. The null hypothesis that subjects randomized with equal probability between Clumped1 and Clumped2 is rejected at the 10% level (binomial test, $p = 0.09$). Thus, there seems to be a weak preference for sooner information, in line with Koszegi and Rabin (2009).[23]

Another interesting question is whether framing influences sooner-later preferences (Loewenstein, 1987). To answer this question, we need to compare the GainSL with the LossSL treatments. Our data does not show much difference by framing: the percentage of subjects preferring sooner over later information is 55% in the GainSL and 57% in the LossSL treatment. This minor difference is not significant (untabulated OLS results).

[23]Since this model had separate predictions for the Sooner-Later and for the Clumped-Piecewise treatments, one could also test their predictions for the CP treatments separately from the SL treatments. Recall that Koszegi and Rabin (2009) predicts that in the CP treatments Clumped1 should be preferred over Piecewise irrespective of gain-loss domain. When we pool data from the GainCP and LossCP conditions, we find that 47% of subjects preferred Clumped1 over Piecewise. This share is not significantly different from 50% (binomial test, p=0.44). Thus, Koszegi and Rabin (2009) is not supported by this result.

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4.3. Summary of results in relation to the theories

We found a clear preference for piecewise information in the gain domain but no significant preference in the loss domain, which supports the hypotheses of Thaler (1985) partially. Interestingly, this partially supportive pattern resembles findings from his later work: recall that Thaler and Johnson (1990) found a preference for segregating hypothetical gains but not for integrating hypothetical losses. As for Koszegi and Rabin (2009), we do not find any support for their prediction that clumped information is preferred over piecewise information, though the pure Sooner-Later result is inline with their prediction (weak preference for sooner information). As for Ely et al. (2015), they predict a general preference for piecewise information, and there is weak support for this in that the piecewise preference is weakly significant in the pooled data. Finally, as discussed in section 3, it is possible that aggregate choice patterns reflect underlying preference heterogeneity. If so, a plausible candidate explanation for the observed pattern – separation in the gain domain, no clear preference in the loss domain, and a weak overall preference for separation – is that both Thaler (1985) – type and Ely et al. (2015) – type preferences are present in the population.

5. Discussion

How do our findings compare to those from other information experiments? Are there notable similarities or differences in designs and results? Below we discuss these questions and the implications.

5.1. Clumped-versus-piecewise preferences

In this subsection we focus on clumped-piecewise choices, and put the findings of other studies in a gain-loss framework. We highlight that the patterns in the literature are in line with our results: piecewise information tends to be popular in settings that are in the gain domain, but not in settings that are arguably in the loss domain.

We start with Zimmermann (2014), who does not have separate gain-loss treatments but served as inspiration for our experiment in other aspects. In Zimmermann (2014) subjects participate in a lottery where winning and losing money are both possible (all subjects get a starting balance to cover potential losses). Subjects can choose between clumped and piecewise information, and Zimmermann (2014) finds that about half of the subjects choose both options.

Falk and Zimmermann (2017); Falk and Zimmermann (2023) go further and include both Sooner-Later treatments and Clumped-Piecewise treatments, which served as further inspiration for our design. Their treatments are arguably in the loss domain, since in their experiment the lottery determines whether subjects receive electric shocks (a negative event). The color of cards in envelopes determine whether the negative event occurs, and subjects choose how they want to be informed about the content of their five envelopes. The authors find that the fraction of subjects choosing early clumped information in the Clumped-Piecewise treatments is significantly higher than the fraction choosing this option in the Sooner-Later treatments. Thus, they find a preference for clumped information in the loss domain.

In the gain domain, Nielsen (2020) conducts an experiment in which subjects receive either a high or a low monetary prize. Nielsen (2020) focuses on comparing an Information Structure treatment, in which lottery outcomes are determined before the information choice is made, to a Lottery treatment, in which lotteries are conducted only when needed for information provision. Note that our case falls between these two settings: our lottery outcomes are not yet determined when our subjects choose between the information options, but they are determined on the day of the session, well before subjects receive the information.[24] In Nielsen (2020), the overall probability of getting the high prize is 50%, but subjects can decide how to resolve the uncertainty by choosing their most preferred two-stage lottery or information structure. Nielsen (2020) finds that gradual resolution is more popular

[24]The instructions clarify this as follows: "The two lotteries are conducted today after the experimental session."

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in the Lottery treatment than in the Information Structure treatment. She also concludes that on the whole, gradual resolution is generally preferred over one-shot resolution in both treatments. Other gain-domain experiments also indicate a preference for piecewise information: Kocher et al. (2014) find that most subjects prefer to spread lottery tickets over drawings and Masatlioglu et al. (2023) find that most individuals prefer gradual resolution over late resolution.[25]

A working paper by Gul et al. (2022) presents an experiment that is motivated differently from ours yet uses a 2x2 design that could be interpreted analogously to ours. In Gul et al. (2022), subjects have to choose one of three boxes and then choose how to get informed about the boxes' contents. In their treatments G1 and O1 (G2 and O2), one (two) of the boxes contains a monetary prize. Gain-loss perceptions can vary across treatments as the number of prize-containing boxes varies: when only one box contains a prize, subjects may focus on getting that 'winning box', while in treatments with only one empty box, subjects may focus on avoiding that 'losing box'. The other treatment variation of Gul et al. (2022) is analogous to our CP-SL variation. Our GainCP and LossCP treatments are paralleled by the G1 and G2 treatments: subjects choose between early full information (i.e. their chosen box is opened first) and piecewise information (i.e. sequential revelation starting with an unchosen box). Our GainSL and LossSL treatments are paralleled by the O1 and O2 treatments: subjects choose between early and late clumped information (i.e. all boxes are opened at the same time, either sooner or later). Gul et al. (2022) report the following choice percentages for the Early option: 39% in G1, 66% in O1, 59% in G2, 65% in O2.[26] This pattern resembles our findings. The share in G1 is markedly lower than in all other treatments (as it was in our GainCP treatment). There is a significant difference between the G1 and O1 treatments (which are similar to our GainCP and GainSL treatments), but not between the G2 and O2 treatments (which are similar to our LossCP and LossSL treatments).[27] A possible interpretation for the similarity in results is that like ours, their findings also reflect preferences when individuals consider gains versus losses.[28]

Another working paper, Lee et al. (2024), investigates clumped-piecewise choices when information is about values versus probabilities. In Lee et al. (2024) subjects get cards with numbers that either refer to monetary values or to probabilities of receiving 100$. For example, their cards may state 40$, 60$ and 80$, or 40%, 60% and 80%. Two of the three cards will be randomly removed, so the payoff will be based on the remaining one. The information options are early clumped information (i.e. removing two cards at once), and piecewise information (i.e. removing two cards sequentially).[29] Gain-loss variation is also implemented, with negative numbers on the cards that are to be subtracted from 100$ or 100%. Lee et al. (2024) find that about 76% (55%) of the subjects choose piecewise information in the gain (loss) frame in the monetary value treatments. They also find that in the probability treatments a lower share chooses piecewise information and the gain-loss difference is smaller: 44% (38%) chooses piecewise in the gain (loss) frame in these treatments. Lee et al. (2024) did not include Sooner-Later treatments in their design so it is not possible to determine the extent to which their findings reflect clumped-piecewise versus sooner-later preferences. Nonetheless, it is interesting to observe that their results point in the direction of ours.

[25]The main focus of Masatlioglu et al. (2023) is on skewness preferences.

[26]These numbers are from Table 7 of Gul et al. (2022), which reports the share choosing the Early option among subjects who exhibit strict preference in their study.

[27]Gul et al. (2022) reports p=0.001 for G1 vs O1 and p=0.286 for G2 vs O2 from sign tests on subjects who exhibit strict preference in all of the decision problems.

[28]The motivation of Gul et al. (2022) differs from ours. Instead of a gain-loss framework, they focus on peak-trough utility theory (Gul et al., 2021), which posits that subjects place special emphasis on their best (peak) and worst (trough) experiences along the realized path of uncertainty. By varying whether one or two boxes contain a prize, their design varies probabilities. This leads to variation in peaks and troughs and they argue that this explains the markedly different behavior in G1. However, this theory cannot explain why the patterns are similar in our experiment, where the gain-loss variation is purely framing and does not change probabilities.

[29]Lee et al. (2024) also allow indifference as a third option; it is chosen by a relatively small fraction of subjects.

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Taking the results from all these studies together, we can see an alignment with our findings in that piecewise information tends to be preferred in the gain domain, not in the loss domain. These patterns are supportive of the idea that gain-loss distinctions are relevant for information preferences.[30]

5.2. Sooner-vs-later preferences

Regarding sooner-later choices, a preference for early resolution is the most common finding in the literature (Brown & Kim, 2013; Eliaz & Schotter, 2010; Kocher et al., 2014; Masatlioglu et al., 2023). However, results are not universal and have been found to depend on context (e.g. on stakes, see Ganguly and Tasoff, 2017), which makes it important to examine sooner-later preferences in different settings. Distractions and timing are noteworthy contextual factors. Falk and Zimmermann 2017; Falk and Zimmermann 2023 show that later information becomes more attractive when subjects can distract themselves while waiting. This is relevant for our study as our subjects can also distract themselves at home across days. Furthermore, Nielsen (2020) finds that individuals prefer early information if the outcome has been determined before the information choice, but they prefer later information if lotteries are conducted just before information provision. Our study does not fall neatly into either of the categories in Nielsen (2020), as our lottery drawings happen right after the experimental session but information provision can only start the next day. It is thus interesting to observe that in our setting there is a weakly significant preference for early information, with 56% of subjects choosing the sooner option overall in our Sooner-Later treatments. We also find that gain-loss framing has no significant effect on sooner-later preferences, which is in line with Gul et al. (2022) not finding a difference between their O1 and O2 treatments.

6. Conclusions

We investigated preferences for clumped-versus-piecewise information and for sooner-versus-later information both in a gain and in a loss frame. Our gain-loss variation was motivated by the idea that a status quo reference point could matter for information preferences. In particular, we reinterpreted the hedonic editing hypothesis of Thaler (1985) in the context of information preferences, leading to the prediction that subjects prefer piecewise information in the gain domain and clumped information in the loss domain. As we bridged the information preference literature with the hedonic editing hypothesis, we implemented a more comprehensive design than previous studies. In turn, we make contributions in three ways.

Our first, main contribution is that we provide interesting new insights into information preferences. Our 2x2 design enables us to examine both clumped-versus-piecewise preferences and sooner-versus-later preferences under both gain and loss framing. As could be seen from the detailed discussion in section 5, ours is the first experiment to do this. Other studies focused only on one domain (e.g. Falk and Zimmermann, 2017; Falk and Zimmermann, 2023; Nielsen, 2020), or could not separate clumped-versus-piecewise preferences from sooner-later preferences (Lee et al., 2024), or varied factors other than framing and hence have multiple interpretations (Gul et al., 2022). Our experiment uncovers that subjects prefer piecewise information when lottery outcomes are framed as gains, and have no clear preference for clumping or separating information when the outcomes are framed as losses. For sooner-later preferences, we find a weak overall preference for sooner information.

[30]We believe that a wider recognition of this could bring future research forward. For example, experimentalists may benefit from explicitly introducing a gain-loss framework in their designs, like we did in our experiment. For theorists, an exciting direction for future research could be to formulate new models that apply insights from Thaler (1985). For example, extending theoretical work on attention (e.g. Golman & Loewenstein, 2018; Golman et al., 2021a) to focus on clumped-versus-piecewise preferences may be fruitful in this regard.

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Our findings have implications for information providers such as policymakers, managers, and researchers who wonder about how to tailor their communication practices to information preferences. Given that we uncover a clear preference for piecewise information in the gain domain, policymakers may want to share news about benefits or positive policy outcomes gradually and managers may want to announce bonuses or positive organizational changes piecewise. Similarly, researchers may want to inform participants about different components of their rewards separately.[31] In the loss domain, our data do not favor either clumped or piecewise reporting. Finally, the sooner-later results indicate the importance of timely updates.

Our second, additional contribution concerns debates about theories. We compare our results to theoretical predictions and find that the data does not fully support any of the models, but the domain-specific results provide partial support for Thaler (1985) in that subjects prefer separation in the gain domain, and the pooled results on clumped-versus-piecewise preferences provide weak support for Ely et al. (2015). Importantly, by testing both Koszegi and Rabin (2009) and Thaler (1985) we bring the discussion on the basis of reference points into the information preferences literature. Previous studies contrasted and tested different reference-dependent models in other contexts (such as effort provision, exchange, and choices between gambles), or focused only on the expectation-based predictions of Koszegi and Rabin (2009) (Zimmermann, 2014; Nielsen, 2020; Falk and Zimmermann, 2017; Falk and Zimmermann, 2023). Bringing the discussion about the basis of reference points into the study of information preferences is important, because it relates to a core question. In particular, a recurring theme in the literature is the relevance of a good-versus-bad distinction for information preferences, but there is no consensus on what is considered 'good' or 'bad' (Loewenstein, 1987; Gul et al., 2022; Gul et al., 2021). Reference-dependent theories naturally speak to this issue: they put forward that good (bad) is what is above (below) the reference point. In the expectations-based model of Koszegi and Rabin (2009), winning less (more) than expected feels like a loss (gain), so it is bad (good). Bringing in the ideas of Thaler (1985) opens the door to more intuitive perspectives, such as interpreting good as better than the status quo and bad as worse. Given our findings, we believe that the literature would benefit from incorporating such intuitive perspectives in future studies of information preferences.

Finally, we also consider it an additional contribution that we link the ideas behind the hedonic editing hypothesis to a new, incentivized framework. Thaler (1985) is a core topic in behavioral and experimental economics courses. It is important to test the concepts that we teach in incentivized settings, especially since the experimental economics part of such courses treats incentivization as a standard. We believe that our partially supportive findings, which echo patterns from the early, hypothetical literature, are an interesting addition to this line of research too.

In sum, our study relates the hedonic editing literature to a new, incentivized setting, contributes to discussions about the empirical validity of different theories, and provides new, policy-relevant insights into information preferences.

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Replication material. The replication material for the study is available at https://doi.org/10.17605/OSF.IO/HFR58.

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[31] Researchers could consider not only payment overviews but also the design. For example, when paying randomly selected participants in survey experiments, instead of one large lottery they could create multiple smaller lotteries (e.g. one for each question). In behavioral field experiments, they could consider more piecewise communication of rewards (e.g. weekly instead of monthly reports about rewards earned for daily habits or achievements).

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