Online Appendix

A. Supplemental Analyses and Tables for Studies 1-4

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A. Supplemental Analyses and Tables for Studies 1-4

Study 1

Methods

Task. The questionnaire contained questions designed to get at whether participants believed their choices would truly affect their payments, whether they believed delayed payment promises, whether they felt an experimenter demand effect by asking whether they were thinking about "what we [the experimenters] wanted" them to do. In the data 91% of participants believed their choices impacted their payments, 93% believed if they chose the delayed payment they would be paid at that later point in time, and 98% were making the choices they wanted to make without thinking about what the experimenters wanted.

Results

Choices. To examine whether the likelihood to choose the patient option changes as the experiment progressed, we ran a mixed-effects logistic regression where a binary variable for whether or not a patient choice was made was regressed on the trial number. The propensity to choose the patient option did not change with trial number (β = 0.0001, p = 0.273). Additionally, we can directly compare behavior in the first several trials to the last several trials. In the first 3 trials, participants chose the patient option 44.2% (SD = 39.0%) of the time compared to the last 3 trials where participants chose the patient option 44.2% (SD = 44.1%) of the time (t(42) = 0.00, p = 1.000). In the first 5 trials, participants chose the patient option 38.6% (SD = 35.6%) of the time compared to the last 5 trials where participants chose the patient option 44.2% (SD = 39.4%) of the time (t(42) = 1.21, p = 0.234). In the first 10 trials, participants chose the patient option 38.8% (SD = 32.4%) of the time compared to the last 5 trials where participants chose the patient option 44.9% (SD = 38.0%) of the time (t(42) = 1.82, p = 0.077). Furthermore, in the first 3 trials, 82.2% (SD = 24.5) of model predictions were correct compared to 89.9% (SD = 21.2) in last 3 trials (t(42) = 1.95, p = 0.058). In the first 5 trials, 84.7% (SD = 19.5) of model predictions were correct compared to 88.8% (SD = 18.7) in last 5 trials (t(42) = 1.13, p = 0.262). In the first 10 trials, 85.3% (SD =

14.9) of model predictions were correct compared to 89.8% (SD = 13.5) in last 10 trials ($t(42) = 1.82$, $p = 0.076$).

Response Times. A linear mixed-effects regression of response time on trial number found a quantitatively small but significant effect of the trial number coefficient ($\beta = -0.005$, $p < 0.001$). The size of this effect indicates that over the course of all 216 trials the average response time only decreased by 0.005 x 216 = 1.08 seconds. Additionally, a mixed-effects regression of response time on trial number, difficulty, and their interaction revealed that both trial number and difficulty were significant (trial number: $\beta = -0.005$, $p < 0.001$; difficulty: $\beta = -0.054$, $p < 0.001$), but the interaction was not ($\beta = 0.000$, $p = 0.105$), which suggests that participants made relevant computations throughout the course of the experiment.

Average fixation patterns. We examined whether faster versus slower decisions resulted in a different distribution of relative attention to the ROIs by calculating relative attention to each ROI based on a median split of response time within each participant. We did not find evidence to suggest there was a difference in in relative attention to the earlier amount (fast: M = 25.2%, SD = 5.2%; slow: M = 25.0%, SD = 1.9%; $t(42) = 0.37$, $p = 0.716$), earlier date (fast: M = 22.9%, SD = 7.7%; slow: M = 22.3%, SD = 2.8%; $t(42) = 0.59$, $p = 0.559$), delayed amount (fast: M = 26.3%, SD = 8.5%; slow: M = 26.5%, SD = 3.1%; $t(42) = 0.27$, $p = 0.792$), or the delayed date (fast: M = 25.6%, SD = 6.3%; slow: M = 26.1%, SD = 2.5%; $t(42) = 0.66$, $p = 0.516$) that varied based on response time.

Within participant analysis. We first address whether there was a sizable correlation between fixation count and fixation duration. We ran a linear mixed-effects regression of fixation duration (in milliseconds) on fixation number, both overall and separately for each ROI. The results appear in Online Appendix Table 4. Overall, fixation count was not a significant predictor of fixation duration, as given by the left-most column. At the level of each ROI, only the earlier date ROI had a significant correlation

between fixation count and fixation duration. Although significant, the size of the effect is quite small. To see why note that, on average, only 1.4 fixations are made to the earlier delay ROI. Given that one additional fixation decreases fixation duration by 8.1 ms, this would not have a sizeable effect on the relative attention metric.

Online Appendix Table 5 presents the regression results from Table 3 when the dependent variable is the number of fixations. Although attention to all four ROIs is correlated with patience, the largest effects appear on the earlier date and the delayed amount which mimics the results when the dependent variable was relative or absolute attention.

We next examined whether the magnitude of the coefficient on the delayed amount and earlier date were significantly larger than the coefficients on the other features. Using the relative attention metric, the delayed amount was significantly different from the earlier amount ($z = 6.30$, $p < 0.001$) and the delayed date ($z = 4.03$, $p < 0.001$); the earlier date was significantly different from the earlier amount ($z = 6.83$, $p < 0.001$) and delayed date ($z = 8.30$, $p < 0.001$). Using the absolute attention metric, the delayed amount was significantly different from the earlier amount ($z = 5.75$, $p < 0.001$) and marginally different from the delayed date ($z = 0.39$, $p = 0.087$); the earlier date was significantly different from both the earlier amount ($z = 5.74$, $p < 0.001$) and the delayed date ($z = 8.29$, $p < 0.001$). Using the number of fixations attention metric, the delayed amount was significantly different from the earlier amount ($z = 7.67$, $p < 0.001$) but not the delayed date ($z = 0.35$, $p = 0.729$); the earlier date was significantly different from the earlier amount ($z = 4.08$, $p < 0.001$) and delayed date ($z = 10.33$, $p < 0.001$).

As referenced in the main text in Footnote 3, one potential concern regarding the results between attention and patience is that the findings could be a consequence of mixing groups of participants with different decision strategies, as indicated by the potential models in Figure 1. For example, if the participants consisted of an equal number of those who utilized attribute-based and option-based models, then combining these groups in a single analysis could maintain the significant impact of the earlier date and delayed amount, but eliminate the mixed impact of the earlier amount and delayed date. To address

this, we sought to identify the common search strategies among participants and followed the method used in Reeck et al. (2017).

First, we performed *k*-means clustering to identify common search strategies based on participants' saccade patterns. A two-cluster solution provided the best fit, as determined by the lowest BIC, and produced groups of size 15 and 28 in Cluster 1 and 2, respectively (BIC for 2 clusters was 7692.9; BIC for 3 clusters was 7728.1; BIC for 4 clusters was 7771.8). Cluster 1 was characterized as having a higher rate of attribute-based search, indicative of comparative searchers. Meanwhile, Cluster 2 had comparatively more option-based search, indicative of integrative searchers.

Reeck et al. (2017) found that search strategy predicted patience in that a higher rate of attribute-based search was positively associated with patience. Certain analyses here allow for a conceptual replication of this finding. For example, a logistic mixed-effects regression of choice on the fraction of horizontal saccades in a trial found that increased attribute-based search positively correlated with patience ($\beta = 0.59$, $p = 0.020$). However, there was no significant difference in patience between clusters (Cluster 1: mean = 35.7%, SD = 27.5%, Cluster 2: mean = 46.3%, SD = 37.7%, $t(37) = 1.05$, $p = 0.302$) or when the cluster was used to predict patience in a mixed-effects regression ($\beta = 0.46$, $p = 0.473$). Note that despite a number of differences between the experimental design here compared to Reeck et al. (2017) (e.g., differently sized samples, use of eye tracking rather than Mouselab, no delay versus acceleration frame), one of the analyses here replicates the central finding that comparisons within an attribute were positively associated with patience.

Next, we examined the within-participant attention results separately for each cluster in order to investigate potential differences in how attention to features of the choice set were associated with patience. Online Appendix Table 6 reports the results. In both clusters, the strongest effects were found on the delayed amount and earlier date, which were respectively positively and negatively associated with patience across all three attention metrics. The relationship between attention to other features and patience depended on the attention metric used, but were not indicative of differential results between clusters. For example, in the relative attention metric Cluster 1 found a negative relationship with the

earlier amount and a positive relationship with the delayed date, which is indicative of an option-based bias even though Cluster 1 was characterized as having a higher rate of attribute-based search. However, Cluster 2 did not find a statistically significant relationship with these two features although the point estimates were in the same direction. In the absolute attention metric, both clusters found that attention to the delayed date was positively correlated with patience, but only Cluster 2 found a significant relationship with the earlier date which was negatively correlated with patience. However, the sign of the point estimate on the earlier amount was in the same direction in both clusters. In the fixation count metric, both clusters saw a similar relationship with a negative association between the earlier amount and patience and a positive association between the delayed date and patience. Overall, these results do not suggest there were large differences in the relationship between attention to features of the choice set and patience between clusters.

Finally, we tested whether search strategy (i.e., as measured by the proportion of horizontal saccades) and attention to the features of the choice set that were previously associated with patience (i.e., the delayed amount and earlier date) jointly predicted patience. A logistic mixed-effects regression found all three features predicted patience, regardless of the attention metric used (relative attention: horizontal saccades $\beta = 0.49$, $p = 0.049$; earlier date $\beta = -5.20$, $p < 0.001$; delayed amount $\beta = 2.23$, $p < 0.001$; absolute attention: horizontal saccades $\beta = 0.48$, $p = 0.043$; earlier date $\beta = -1.92$, $p < 0.001$; delayed amount $\beta = 1.81$, $p < 0.001$).

The above analysis assumes that the attribute-based and option-based strategies can be teased apart using saccade patterns. In other words, participants adopting an attribute-based strategy are more likely to make within attribute transitions while those adopting an option-based strategy are more likely to make within option transitions. An additional way to test whether mixing participants utilizing two different decision strategies could lead to the effects found in Table 3 involves conducting the regressions from Table 3 at the participant level and examining the sign and significance of the participant-specific effects. If an equal number of participants had significant effects of all ROIs on attention, but the sign on the earlier amount and delayed date were mixed across participants while the sign on the delayed amount

and earlier date were consistent across participants, then this would suggest participants used different models in their decision process and this could generate the previously discussed results. To test this, conducted the four relative attention regressions of choice on attention in Table 3 at the participant level and examined the results. Given the findings above, such a scenario may be unlikely but serves as an additional robustness check.

We found that more participants had statistically significant effects of attention to the delayed amount and earlier date than to the earlier amount and delayed date. Specifically, 24 participants had a significant effect of attending to the earlier date (all coefficients negative) and 18 had a significant effect of attending to the delayed amount (all positive). In contrast, only 10 participants had a significant effect of attending to the earlier amount (8 negative, 2 positive) and 14 had a significant effect of attending to the delayed date (10 positive, 4 negative). Overall, the results do not suggest an equal number of participants utilized option-based and attribute-based decision strategies.

In reference to the additional robustness checks, Online Appendix Table 7 omits the final fixation, Online Appendix Table 8 removes the first fixation, Online Appendix Table 9 includes only those participants who displayed an intermediary level of patient behavior, Online Appendix Tables 10-12 includes only the first 3, 5, or 10 trials that a participant responded to, respectively, and Online Appendix Tables 13 and 14 report the analysis when features are combined by option and attribute, respectively.

Between participants analysis. Online Appendix Table 15 reports the results of Table 4 where the measurement of attention is fixation count, Online Appendix Table 16 omits the final fixation from the analysis, Online Appendix Table 17 removes the first fixation from the analysis, and Online Appendix Tables 18 and 19 report the analysis when features are combined by option or attribute, respectively. These additional analyses largely suggest that the results above hold under a number of restrictive circumstances.

Changes in fixations across trials. Online Appendix Table 20 reports a version of the analysis reported in Table 5 uses absolute rather than relative attention, and Online Appendix Table 21 reports a version of the analysis that uses fixation count as the attention metric. Across the various attention metrics, the maximum possible effect of shifting a feature from its minimum to maximum value, reported in bold, remains small. Online Appendix Tables 22-24 report the analysis from Table 5 using only the first 3, 5, and 10 trials, respectively, and find that even at an early point in the task feature values have a relatively small effect on the amount of attention deployed to a ROI.

Study 2

Task. As in the previous experiment, this questionnaire contained questions designed to get at whether participants believed their choices would truly affect their payments, whether they believed delayed payment promises, and whether they felt an experimenter demand effect. In the data 92% of participants believed their choices impacted their payments, 89% believed if they chose the delayed payment they would be paid at that later point in time, and 94% were making the choices they wanted to make without thinking about what the experimenters wanted. In an open-ended response to the question "what do you believe this study is about," only one participant made any reference to changes in attention across trials (and this comment specifically referenced the order of the attribute appearance, but not that relative or total attention to attribute varied) and no participants mentioned that different trials had different fixation lengths for attributes.

Results. As participants exhibited a range of patient behavior and since it may be difficult to nudge the behavior of those participants who opted to choose patiently or impatiently for the majority of trials, we sought to examine how the manipulation biased those participants who displayed an intermediary level of patience. 20 participants chose patiently greater than 20% of the time but less than 80% of the time and the fixation manipulation had a stronger effect among this subgroup. These participants made 35.7 patient choices (SD = 14.9) when amounts were displayed for longer than delays, and 32.5 patient choices (SD =

14.2) in the other case ($t(19) = 4.80$, $p < 0.001$; $SD_{Diff} = 3.0$). This amounts to a 10% increase in the number of patient choices. Additionally, pooling all participants and limiting our analysis to the first 30 trials in each condition, we found that participants made 14.2 (SD = 8.9) patient decisions when amounts were displayed for longer than delays, and 13.3 (SD = 8.7) patient decisions when delays were displayed for longer than amounts ($t(35) = 1.82$, $p = 0.078$). A similar result was found when we examined at the estimated discount rates: the estimated $\log(k)$ was -5.20 when amounts were shown for longer than delays and -4.95 otherwise ($t(35) = 2.95$, $p = 0.006$).

Study 3

Task. As in the previous experiments, this questionnaire contained questions designed to get at whether participants believed their choices would truly affect their payments, whether they believed delayed payment promises, and whether they felt an experimenter demand effect. In the data 100% of participants believed their choices impacted their payments, 94% believed if they chose the delayed payment they would be paid at that later point in time, and 100% were making the choices they wanted to make without thinking about what the experimenters wanted. In an open-ended response to the question "what do you believe this study is about," no participant made any reference to changes in attention across trials or that different trials had different fixations lengths for options, though it is possible they may have still made this association without reporting it.

Results. As participants exhibited a range of patient behavior and since it may be difficult to nudge the behavior of those participants who opted to choose patiently or impatiently in the majority of trials, we sought to examine how the manipulation biased those participants who displayed an intermediary level of patience. 12 participants chose patiently greater than 20% of the time but less than 80% of the time and the fixation manipulation had a stronger effect among this subgroup. These participants made 21.3 patient choices (SD = 8.0) when the delayed option was the target, and 17.9 patient choices (SD = 7.9) when the

earlier option was the target ($t(11) = 5.61$, $p < 0.001$; $SD_{Diff} = 2.1$). This amounts to a 19% increase in the number of patient choices.

Online Appendix Table 1

Question Number	Delayed Amount	Earlier Amount	Delayed Delay	Earlier Delay	Fraction Patient
1	18	17	17	7	0.37
2	18	17	24	3	0.23
3	18	18	14	0	0.07
4	18	18	16	6	0.05
5	19	18	10	0	0.30
6	19	18	16	2	0.35
7	19	18	36	6	0.26
8	20	17	33	3	0.42
9	20	17	51	1	0.26
10	20	18	15	1	0.47
11	20	18	16	4	0.49
12	20	19	14	2	0.37
13	20	19	93	3	0.12
14	21	17	99	4	0.28
15	21	18	30	0	0.42
16	21	19	30	0	0.37
17	21	19	31	3	0.33
18	21	19	54	4	0.21
19	21	20	7	0	0.49
20	21	20	13	6	0.37
21	21	20	45	0	0.09
22	21	21	14	7	0.02
23	22	17	28	0	0.49
24	22	17	33	3	0.44
25	22	18	101	6	0.21
26	22	19	23	2	0.47
27	22	19	32	7	0.44
28	22	20	42	2	0.28
29	22	21	32	2	0.19
30	22	21	106	6	0.05
31	22	22	15	5	0.05
32	23	18	26	5	0.56
33	23	18	37	7	0.44
34	23	20	13	3	0.58
35	23	20	60	0	0.21
36	23	20	63	3	0.21
37	23	21	43	3	0.26
38	23	22	10	0	0.35
39	23	22	32	4	0.16
40	23	22	106	6	0.05
41	24	17	30	5	0.56
42	24	17	52	2	0.35
43	24	19	157	7	0.30
44	24	20	7	0	0.60
45	24	20	23	2	0.49
46	24	21	7	0	0.63
47	24	21	18	6	0.49
48	24	22	28	7	0.35
49	24	22	182	2	0.07
50	24	23	20	6	0.33
51	24	23	201	1	0.05
52	24	24	12	0	0.02
53	25	19	27	2	0.56
54	25	19	40	0	0.40
55	25	19	66	6	0.35
56	25	20	13	1	0.60
57	25	23	26	5	0.35
58	25	24	50	5	0.12

Question Number	Delayed Amount	Earlier Amount	Delayed Delay	Earlier Delay	Fraction Patient
59	25	25	18	6	0.05
60	26	17	105	5	0.33
61	26	21	27	2	0.56
62	26	21	31	6	0.44
63	26	21	102	2	0.23
64	26	21	152	2	0.28
65	26	21	180	0	0.28
66	26	22	14	7	0.53
67	26	23	20	6	0.53
68	26	24	17	7	0.44
69	26	25	19	7	0.37
70	26	25	24	3	0.33
71	26	25	95	5	0.09
72	26	26	14	0	0.07
73	27	17	19	5	0.70
74	27	17	54	4	0.44
75	27	17	152	2	0.35
76	27	21	13	6	0.60
77	27	22	13	1	0.58
78	27	27	12	5	0.07
79	28	20	33	5	0.56
80	28	20	201	1	0.28
81	28	21	15	3	0.65
82	28	21	29	4	0.56
83	28	26	57	7	0.21
84	29	18	66	6	0.44
85	29	18	93	3	0.44
86	29	18	99	4	0.40
87	29	22	66	6	0.30
88	29	22	92	2	0.33
89	29	22	156	6	0.28
90	29	23	18	4	0.53
91	29	23	46	1	0.44
92	29	23	104	4	0.28
93	29	23	184	4	0.28
94	29	24	14	4	0.56
95	29	24	24	3	0.51
96	29	25	13	3	0.56
97	29	25	52	7	0.28
98	29	26	8	1	0.60
99	29	26	33	5	0.44
100	29	26	201	1	0.12
101	29	27	28	3	0.30
102	29	27	31	1	0.30
103	29	28	32	4	0.19
104	29	28	201	1	0.07
105	30	19	18	4	0.74
106	30	19	65	5	0.42
107	30	19	185	5	0.35
108	30	20	23	2	0.63
109	30	23	94	4	0.37
110	30	23	97	2	0.35
111	30	28	32	7	0.35
112	30	28	182	2	0.09
113	31	17	26	1	0.65
114	31	17	31	3	0.67
115	31	17	50	5	0.56
116	31	17	180	0	0.40
117	31	22	17	5	0.67
118	31	22	65	5	0.35
119	31	22	157	7	0.35

Question Number	Delayed Amount	Earlier Amount	Delayed Delay	Earlier Delay	Fraction Patient
120	31	22	185	5	0.30
121	31	24	14	7	0.79
122	31	26	11	1	0.67
123	31	26	96	6	0.26
124	31	27	24	3	0.47
125	31	27	26	1	0.42
126	31	27	46	1	0.30
127	31	28	207	7	0.19
128	32	17	201	1	0.33
129	32	20	48	3	0.53
130	32	20	51	6	0.56
131	32	21	30	0	0.63
132	32	23	16	4	0.72
133	32	23	19	5	0.79
134	32	25	15	1	0.65
135	32	26	49	4	0.47
136	32	27	97	7	0.26
137	33	18	57	7	0.56
138	33	25	13	1	0.60
139	33	25	156	6	0.28
140	33	26	16	6	0.67
141	34	18	150	0	0.42
142	34	22	35	7	0.63
143	34	24	19	5	0.72
144	34	24	32	7	0.63
145	34	24	54	4	0.51
146	34	24	65	5	0.40
147	34	24	153	3	0.33
148	34	28	31	1	0.44
149	34	28	34	4	0.51
150	34	28	56	6	0.35
151	35	19	102	2	0.42
152	35	25	34	6	0.65
153	35	25	50	5	0.44
154	35	25	97	2	0.42
155	35	27	33	5	0.53
156	36	19	65	5	0.51
157	36	19	100	5	0.47
158	36	19	207	7	0.37
159	36	23	101	1	0.37
160	36	24	103	3	0.37
161	36	26	185	5	0.33
162	36	26	206	6	0.23
163	36	27	95	0	0.33
164	36	28	13	3	0.74
165	36	28	23	2	0.63
166	37	20	32	7	0.70
167	37	23	43	3	0.53
168	37	28	47	7	0.49
169	38	20	66	6	0.47
170	38	24	151	1	0.35
171	38	25	25	4	0.70
172	38	27	13	6	0.81
173	38	27	40	0	0.56
174	38	27	41	1	0.51
175	38	27	51	6	0.40
176	38	27	97	2	0.42
177	39	18	97	2	0.51
178	39	18	183	3	0.42
179	39	21	90	0	0.44
180	39	21	187	7	0.37

Question Number	Delayed Amount	Earlier Amount	Delayed Delay	Earlier Delay	Fraction Patient
181	39	25	183	3	0.42
182	39	28	14	7	0.79
183	40	22	101	1	0.44
184	40	25	90	0	0.40
185	40	26	32	2	0.67
186	41	26	32	4	0.67
187	41	26	101	1	0.42
188	41	26	204	4	0.37
189	42	23	45	0	0.58
190	42	26	50	0	0.60
191	42	27	200	0	0.35
192	43	20	183	3	0.42
193	43	23	47	7	0.65
194	44	24	30	2	0.79
195	44	24	52	2	0.53
196	45	21	151	1	0.40
197	45	24	99	4	0.47
198	45	28	42	2	0.65
199	45	28	99	4	0.44
200	47	25	40	0	0.70
201	48	22	44	4	0.67
202	50	23	61	1	0.63
203	50	23	64	4	0.63
204	51	27	154	4	0.40
205	52	24	57	7	0.65
206	52	24	153	3	0.47
207	52	28	97	7	0.53
208	54	25	96	1	0.53
209	54	25	105	5	0.47
210	56	26	50	0	0.67
211	56	26	205	5	0.42
212	58	27	46	6	0.70
213	58	27	93	3	0.58
214	60	28	94	4	0.58
215	60	28	102	2	0.51
216	60	28	203	3	0.47

Note: Stimulus values and fraction of patient choices for Study 1. Amounts are given in $ and delays are denoted in days.

Online Appendix Table 2

Subject ID	Fraction Patient	Hyperbolic			
		k	ω	χ^2	p
201	0.64	0.0034	0.49	5.09	0.078
202	0.45	0.0071	0.43	1.85	0.396
203	0.03	0.0500	0.39	0.20	0.903
204	0.84	0.0011	0.81	12.98	0.002
205	0.34	0.0131	0.57	2.71	0.258
206	0.16	0.0216	0.60	0.60	0.740
207	0.96	0.0001	1.17	0.00	1.000
208	0.04	0.0396	1.57	0.13	0.937
209	0.66	0.0029	0.66	9.88	0.007
210	0.56	0.0098	0.30	26.67	0.000
211	0.01	0.0500	0.48	0.82	0.664
212	0.96	0.0001	1.17	0.00	1.000
213	0.94	0.0002	1.20	1.68	0.432
214	0.07	0.0335	0.53	0.74	0.692
215	0.05	0.0500	0.35	5.12	0.077
216	0.89	0.0011	1.30	1.44	0.486
217	0.27	0.0146	0.63	0.10	0.953
218	0.02	0.0500	0.55	0.20	0.903
219	0.39	0.0047	0.19	47.20	0.000
220	0.05	0.0500	0.37	5.12	0.077
221	0.93	0.0006	1.25	0.55	0.761
222	0.40	0.0133	0.42	13.03	0.001
223	0.79	0.0014	0.85	29.15	0.000
224	0.06	0.0500	0.45	16.58	0.000
225	0.77	0.0023	0.47	4.60	0.100
226	0.50	0.0064	0.84	1.51	0.470
228	0.02	0.0500	1.35	0.00	1.000
229	0.93	0.0005	1.25	0.07	0.965
230	0.20	0.0193	0.37	0.50	0.779
232	0.07	0.0329	0.48	0.33	0.849
233	0.45	0.0164	0.15	57.49	0.000
235	0.87	0.0014	1.34	1.82	0.402
236	0.46	0.0090	0.71	1.22	0.545
237	0.13	0.0282	0.38	2.58	0.275
238	0.00	0.0500	0.77	3.28	0.194
239	0.77	0.0022	0.66	4.60	0.100
240	0.62	0.0044	0.69	0.18	0.914
241	0.00	0.0500	0.74	3.28	0.194
242	0.50	0.0093	0.53	6.17	0.046
243	0.94	0.0004	1.23	1.68	0.432
244	0.05	0.0464	0.63	4.29	0.117
245	0.16	0.0240	0.58	2.80	0.247
246	0.36	0.0070	0.17	17.80	0.000

Note: Study 1 model fits. χ^2 and p report the χ^2-statistic and p-value for the hyperbolic's model fit to the data

Online Appendix Table 3

Number of Fixations to Each ROI		
A. Spatial		
	Left	Right
Up	1.7 (0.5)	1.5 (0.54)
Down	1.4 (0.5)	1.3 (0.4)
B. Feature of Interest		
	Earlier	Delayed
Amount	1.5 (0.5)	1.6 (0.5)
Delay	1.4 (0.4)	1.5 (0.5)

Note: Number of total fixations to each ROI. (A) The mean number of fixations that were made to each region of interest split by the spatial orientation of the screen: columns are horizontal orientation and rows are vertical orientation. (B) The mean number of fixations that were made to each region of interest split by feature of interest: columns are the earlier and delayed options and rows are monetary amounts and delay dates. Means are taken over participant-specific means, and standard deviations reported below in parentheses.

Online Appendix Table 4

	Any ROI	Earlier Amount	Delayed Amount	Earlier Date	Delayed Date
Constant	260.8**	269.9**	283.8**	266.0**	271.5**
	(6.9)	(8.9)	(11.6)	(6.5)	(7.4)
Fixation Count	1.9	-6.3	-9.6	-8.0*	7.9
	(1.2)	(4.5)	(6.2)	(3.2)	(4.2)

Note: Each column reports the results of a linear mixed-model regression where fixation duration (in ms) was regressed on fixation count. The left column pools all fixations to ROIs in one regression while the other four columns report the regression results separately for each ROI.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 5

ROI	Coefficient Estimates
	Fixation Count
Constant	-1.08
	(0.56)
Earlier Amount	-0.26**
	(0.08)
Delayed Amount	0.56**
	(0.08)
Earlier Date	-0.73**
	(0.15)
Delayed Date	0.49**
	(0.08)

Note: Results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the number of fixations made to each ROI. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10^{th} to the 90^{th} percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 6

A. Cluster 1							
ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	-0.57	-1.82**	0.13	-1.49**	-	-1.54*	-1.88**
	-0.42	(0.44)	(0.43)	(0.41)	-	(0.63)	(0.72)
Earlier Amount	-1.52**	-	-	-	-1.65**	-0.06	-0.17*
	(0.53)	-	-	-	(0.60)	(0.15)	(0.09)
Delayed Amount	-	3.32**	-	-	1.24	0.95**	0.48**
	-	(0.69)	-	-	(0.78)	(0.27)	(0.11)
Earlier Date	-	-	-4.90**	-	-4.66**	-0.92**	-0.43**
	-	-	(0.69)	-	(0.77)	(0.32)	(0.11)
Delayed Date	-	-	-	2.03**	0.60	0.73**	0.46**
	-	-	-	(0.67)	(0.82)	(0.21)	(0.10)
B. Cluster 2							
ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	-0.48	-1.77**	1.00	-0.62	-	-0.56	-0.55
	(0.50)	(0.45)	(0.52)	(0.55)	-	(0.64)	(0.77)
Earlier Amount	-0.12	-	-	-	-0.81	-0.51*	-0.37**
	(0.61)	-	-	-	(0.66)	(0.25)	(0.13)
Delayed Amount	-	4.57**	-	-	2.80*	2.11**	0.63**
	-	(0.89)	-	-	(1.10)	(0.40)	(0.11)
Earlier Date	-	-	-7.07**	-	-5.97**	-3.69**	-0.97**
	-	-	(0.99)	-	(0.90)	(0.86)	(0.24)
Delayed Date	-	-	-	0.26	0.73	1.09**	0.52**
	-	-	-	(0.72)	(0.60)	(0.26)	(0.12)

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the metric of time spent fixating on the ROI of interest. Clusters were formed through a 2-means clustering algorithm on saccade patterns throughout the choice task. Cluster 1 was indicative of an attribute-based search strategy and Cluster 2 was indicative of an option-based search strategy.

Online Appendix Table 7

ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	-0.79*	-0.97**	-0.23	-0.64	-	-0.97*	-1.04*
	(0.36)	(0.37)	(0.35)	(0.38)	-	(0.45)	(0.51)
Earlier Amount	0.42	-	-	-	-0.30	0.27	0.07
	(0.32)	-	-	-	(0.44)	(0.15)	(0.07)
Delayed Amount	-	1.13**	-	-	0.33	0.63**	0.19*
	-	(0.26)	-	-	(0.47)	(0.21)	(0.08)
Earlier Date	-	-	-2.07**	-	-2.40**	-0.90**	-0.30**
	-	-	(0.39)	-	(0.59)	(0.34)	(0.10)
Delayed Date	-	-	-	-0.20	-0.64	0.32	0.15
	-	-	-	(0.39)	(0.45)	(0.20)	(0.09)
Mean Effect Size	0.01	0.04	-0.05	-0.01	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. The participant's final fixation in each trial is excluded from analysis. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10th to the 90th percentile.

Online Appendix Table 8

ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	-0.58	1.26**	0.03	-0.90*	-	-1.01*	-1.10*
	(0.36)	(0.36)	(0.39)	(0.37)	-	(0.47)	(0.53)
Earlier Amount	-0.33	-	-	-	-1.09*	-0.16	-0.21**
	(0.25)	-	-	-	(0.54)	(0.11)	(0.05)
Delayed Amount	-	2.13**	-	-	1.22*	1.48**	0.51**
	-	(0.32)	-	-	(0.51)	(0.25)	(0.08)
Earlier Date	-	-	-3.62**	-	-3.64**	-2.01**	-0.57**
	-	-	(0.56)	-	(0.50)	(0.52)	(0.15)
Delayed Date	-	-	-	0.73	-0.08	0.64**	0.36**
	-	-	-	(0.41)	(0.47)	(0.20)	(0.08)
Mean Effect Size	-0.01	0.07	-0.11	0.03	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. The participant's first fixation in each trial is excluded from analysis. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10th to the 90th percentile.

Online Appendix Table 9

ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	0.18	-1.03**	1.23**	-0.08	-	0.14	0.13
	(0.19)	(0.25)	(0.23)	(0.21)	-	(0.26)	(0.33)
Earlier Amount	-0.30	-	-	-	-0.55	-0.38*	-0.31**
	(0.54)	-	-	-	(0.40)	(0.16)	(0.08)
Delayed Amount	-	4.18**	-	-	2.93**	1.45**	0.55**
	-	(0.77)	-	-	(0.58)	(0.35)	(0.09
Earlier Date	-	-	-5.30**	-	-3.99**	-2.13**	-0.80**
	-	-	(0.90)	-	(0.72)	(0.56)	(0.17)
Delayed Date	-	-	-	0.68	1.05*	0.68**	0.46**
	-	-	-	(0.63)	(0.48)	(0.21)	(0.11)
Mean Effect Size	-0.01	0.21	-0.25	0.03	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. Only those participants who chose patiently greater than 20% of the time and less than 80% of the time are included in the analysis. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10th to the 90th percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 10

ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	1.46	-2.23**	0.50	-1.02**	-	-0.98	-0.79
	(0.84)	(0.81)	(0.71)	(0.00)	-	(0.73)	(0.75)
Earlier Amount	-7.66*	-	-	-	-6.69*	-2.22*	-0.60
	(3.16)	-	-	-	(2.70)	-0.96	(0.39)
Delayed Amount	-	6.94**	-	-	6.29*	2.88**	0.65
	-	(2.63)	-	-	(2.54)	(1.01)	(0.41)
Earlier Date	-	-	-3.97	-	-2.07	-0.65	-0.39
	-	-	(2.72)	-	(2.37)	(0.83)	(0.37)
Delayed Date	-	-	-	2.37**	0.31	0.52	0.45
	-	-	-	(0.00)	(2.59)	(0.56)	(0.32)
Mean Effect Size	-0.35	0.31	-0.18	0.11	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. Only the first three trials a participant faced were included in the analysis. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10th to the 90th percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 11

ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	0.30	-2.62**	0.49	-1.15**	-	-1.67**	-1.66*
	(0.65)	(0.68)	(0.61)	(0.00)	-	(0.62)	(0.66)
Earlier Amount	-4.54*	-	-	-	-4.66*	-1.38	-0.12
	(2.21)	-	-	-	(1.92)	(0.72)	(0.28)
Delayed Amount	-	6.80**	-	-	4.25	2.94**	0.48
	-	(2.04)	-	-	(2.21)	(0.77)	(0.31)
Earlier Date	-	-	-5.74*	-	-5.17*	-1.13	-0.41
	-	-	(2.25)	-	(2.48)	(0.79)	(0.27)
Delayed Date	-	-	-	1.32**	1.48	0.45	0.38
	-	-	-	(0.00)	(1.54)	(0.45)	(0.24)
Mean Effect Size	-0.19	0.27	-0.22	0.06	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. Only the first five trials a participant faced were included in the analysis. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10^{th} to the 90^{th} percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 12

ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	0.18	-1.83**	0.53**	-1.28**	-	-1.66	-1.90**
	(0.19)	(0.45)	(0.00)	(0.44)	-	(0.49)	(0.55)
Earlier Amount	-3.47**	-	-	-	-2.85*	-0.71	0.04
	(1.30)	-	-	-	-1.16	(0.45)	(0.20)
Delayed Amount	-	4.29**	-	-	2.87*	2.14**	0.44*
	-	(1.29)	-	-	-1.44	(0.51)	(0.21)
Earlier Date	-	-	-5.67**	-	-5.14**	-0.98	-0.60**
	-	-	(0.00)	-	-1.67	(0.58)	(0.21)
Delayed Date	-	-	-	2.26	1.53*	0.75	0.63**
	-	-	-	(1.22)	-1.49	(0.46)	(0.21)
Mean Effect Size	-0.15	0.18	-0.21	0.10	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. Only the first ten trials a participant faced were included in the analysis. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10^{th} to the 90^{th} percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 13

ROI	Coefficient Estimates				
	Relative Attention			Absolute Attention	Fixation Count
Constant	1.50**	-2.92**	-	-0.92	-1.03
	(0.40)	(0.38)	-	(0.51)	(0.59)
Earlier Option	-4.61**	-	-3.04**	-1.16**	-0.50**
	(0.47)	-	(0.43)	(0.29)	(0.10)
Delayed Option	-	4.31**	1.51**	1.11**	0.52**
	-	(0.50)	(0.50)	(0.14)	(0.06)
Mean Effect Size	-0.15	0.15	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10th to the 90th percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 14

ROI	Coefficient Estimates				
	Relative Attention			Absolute Attention	Fixation Count
Constant	-1.85**	0.51	-	-1.06*	-1.07
	(0.35)	(0.41)	-	(0.49)	(0.56)
Amounts	2.15**	-	0.40	0.60**	0.17**
	(0.51)	-	(0.52)	(0.13)	(0.05)
Delays	-	-2.54**	-1.95**	-0.39	-0.12
	-	(0.46)	(0.39)	(0.23)	(0.08)
Mean Effect Size	0.09	-0.09	-	-	-

Note: Each column reports the results of a logistic mixed-model regression where an indicator variable for making a patient choice was regressed on a constant and the percentage of time spent fixating on the ROI of interest. Mean effect sizes denote the predicted effect of shifting relative attention towards each attribute, from the 10th to the 90th percentile.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 15

A. Fraction Patient	
ROI	Coefficient Estimates
	Fixation Count
Constant	0.60**
	(0.13)
Earlier Amount	-0.61
	(0.44)
Delayed Amount	0.79*
	(0.38)
Earlier Date	-1.39**
	(0.42)
Delayed Date	0.99*
	(0.41)
R^2	0.57
B. Estimated *k*	
ROI	Coefficient Estimates
	Fixation Count
Constant	0.02**
	(0.01)
Earlier Amount	0.04
	(0.03)
Delayed Amount	-0.05*
	(0.02)
Earlier Date	0.06*
	(0.03)
Delayed Date	-0.04
	(0.03)
R^2	0.48

Note: Each column reports the results of a linear regression where participant-specific measures of patience (top = mean fraction of patient decisions, bottom = estimated log(k)) were regressed on the average time that each participant spent attending to particular ROIs. The slopes and constants from each regression are reported, with standard errors below in parentheses.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 16

A. Fraction Patient							
ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	-0.50	-1.12**	1.60**	1.26**	-	0.60**	0.60**
	(0.25)	(0.26)	(0.17)	(0.31)	-	(0.12)	(0.13)
Earlier Amount	3.58**	-	-	-	1.53	2.78	0.71
	(0.97)	-	-	-	(1.28)	(1.67)	(0.63)
Delayed Amount	-	5.88**	-	-	1.53	-0.29	-0.06
	-	(0.98)	-	-	(1.54)	(1.75)	(0.66)
Earlier Date	-	-	-5.28**	-	-4.00**	-5.43**	-2.42**
	-	-	(0.77)	-	(1.23)	(1.31)	(0.57)
Delayed Date	-	-	-	-3.25**	2.02	1.61	1.41*
	-	-	-	(1.19)	(1.38)	(1.27)	(0.62)
R^2	0.25	0.47	0.54	0.15	-	0.45	0.42
B. Estimated *k*							
ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	0.07**	0.11**	-0.05**	-0.02	-	0.02**	0.02*
	(0.01)	(0.01)	(0.01)	(0.02)	-	(0.01)	(0.01)
Earlier Amount	-0.18**	-	-	-	0.01	-0.10	-0.03
	(0.06)	-	-	-	(0.07)	(0.10)	(0.04)
Delayed Amount	-	-0.35**	-	-	-0.09	-0.07	-0.01
	-	(0.05)	-	-	(0.08)	(0.10)	(0.04)
Earlier Date	-	-	0.31**	-	0.28**	0.24**	0.12**
	-	-	(0.04)	-	(0.07)	(0.08)	(0.03)
Delayed Date	-	-	-	0.16*	-0.08	-0.04	-0.06
	-	-	-	(0.07)	(0.07)	(0.08)	(0.04)
R^2	0.19	0.51	0.57	0.11	-	0.39	0.37

Note: Each column reports the results of a linear regression where participant-specific measures of patience (top = mean fraction of patient decisions, bottom = estimated log(k)) were regressed on the average time that each participant spent attending to particular ROIs. The final fixation in each trial was excluded from the analysis. The slopes and constants from each regression are reported, with standard errors below in parentheses.

** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 17

A. Fraction Patient							
ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	-0.23	-0.44*	1.23**	0.94**	-	0.57**	0.56**
	(0.31)	(0.17)	(0.14)	(0.29)	-	(0.11)	(0.10)
Earlier Amount	2.58*	-	-	-	-0.96	0.24	-0.27
	(1.21)	-	-	-	(1.04)	(1.11)	(0.42)
Delayed Amount	-	3.23**	-	-	2.40**	1.27	0.46
	-	(0.62)	-	-	(0.85)	(0.95)	(0.38)
Earlier Date	-	-	-3.57**	-	-2.99**	-4.28**	-1.72**
	-	-	(0.61)	-	(0.88)	(1.03)	(0.39)
Delayed Date	-	-	-	-2.07	2.76**	1.64	1.30**
	-	-	-	(1.14)	(0.96)	(0.88)	(0.40)
R^2	0.10	0.40	0.45	0.07	-	0.51	0.59
B. Estimated *k*							
ROI	Coefficient Estimates						
	Relative Attention					Absolute Attention	Fixation Count
Constant	0.05**	0.07**	-0.03**	-0.00	-	0.02**	0.02**
	(0.02)	(0.01)	(0.01)	(0.02)	-	(0.01)	(0.01)
Earlier Amount	-0.12	-	-	-	0.13*	0.01	0.02
	(0.07)	-	-	-	(0.06)	(0.07)	(0.03)
Delayed Amount	-	-0.18**	-	-	-0.11*	-0.10	-0.03
	-	(0.04)	-	-	(0.05)	(0.06)	(0.02)
Earlier Date	-	-	0.20**	-	0.22**	0.20**	0.08**
	-	-	(0.04)	-	(0.05)	(0.06)	(0.02)
Delayed Date	-	-	-	0.09	-0.14*	-0.08	-0.06*
	-	-	-	(0.07)	(0.05)	(0.05)	(0.03)
R^2	0.06	0.39	0.44	0.04	-	0.46	0.50

Note: Each column reports the results of a linear regression where participant-specific measures of patience (top = mean fraction of patient decisions, bottom = estimated log(k)) were regressed on the average time that each participant spent attending to particular ROIs. The first fixation in each trial was excluded from the analysis. The slopes and constants from each regression are reported, with standard errors below in parentheses.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 18

A. Fraction Patient					
ROI	Coefficient Estimates				
	Relative Attention			Absolute Attention	Fixation Count
Constant	3.82**	-3.29**	-	0.66**	0.62**
	(0.52)	(0.57)	-	(0.12)	(0.13)
Earlier Option	-7.11**	-	-3.29**	-2.58**	-1.06**
	(1.09)	-	(0.57)	(0.53)	(0.15)
Delayed Option	-	7.11**	3.82**	2.04**	0.95**
	-	(1.09)	(0.52)	(0.45)	(0.14)
R^2	0.51	0.51	-	0.37	0.55
B. Estimated *k*					
ROI	Coefficient Estimates				
	Relative Attention			Absolute Attention	Fixation Count
Constant	-0.18**	0.24**	-	0.02*	0.02**
	(0.03)	(0.03)	-	(0.01)	(0.01)
Earlier Option	0.43**	-	0.24**	0.14**	0.05**
	(0.06)	-	(0.03)	(0.03)	(0.01)
Delayed Option	-	-0.43**	-0.18**	-0.12**	-0.05**
	-	(0.06)	(0.03)	(0.03)	(0.01)
R^2	0.58	0.58	-	0.35	0.47

Note: Each column reports the results of a linear regression where participant-specific measures of patience (top = mean fraction of patient decisions, bottom = estimated log(k)) were regressed on the average time that each participant spent attending to particular ROIs. The slopes and constants from each regression are reported, with standard errors below in parentheses.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 19

A. Fraction Patient					
ROI	Coefficient Estimates				
	Relative Attention			Absolute Attention	Fixation Count
Constant	-0.82**	1.60**	-	0.46**	0.51**
	(0.28)	(0.26)	-	(0.13)	(0.17)
Amounts	2.42**	-	1.60**	1.16**	0.31*
	(0.53)	-	(0.26)	(0.31)	(0.13)
Delays	-	-2.42**	-0.82**	-1.28**	-0.36*
	-	(0.53)	(0.28)	(0.31)	(0.14)
R^2	0.34	0.34	-	0.30	0.14
B. Estimated *k*					
ROI	Coefficient Estimates				
	Relative Attention			Absolute Attention	Fixation Count
Constant	0.09**	-0.04**	-	0.03**	0.03**
	(0.02)	(0.02)	-	(0.01)	(0.01)
Amounts	-0.13**	-	-0.04**	-0.07**	-0.02*
	(0.03)	-	(0.02)	(0.02)	(0.01)
Delays	-	0.13**	-0.09**	0.06**	0.02*
	-	(0.03)	(0.02)	(0.02)	(0.01)
R^2	0.30	0.30	-	0.27	0.13

Note: Each column reports the results of a linear regression where participant-specific measures of patience (top = mean fraction of patient decisions, bottom = estimated log(k)) were regressed on the average time that each participant spent attending to particular ROIs. The slopes and constants from each regression are reported, with standard errors below in parentheses.
** Significant at the 1% level, * Significant at the 5% level.

Online Appendix Table 20

Impact of Attribute Values on Absolute Attention				
	Earlier Amount	Delayed Amount	Earlier Date	Delayed Date
Constant	0.3288	0.4162	0.3706	0.4457
	12.46	14.16	14.99	14.43
Earlier Amount	0.0024	-0.0028	0.0015	-0.0050
	2.22	-2.40	1.66	-4.21
	0.03	**-0.03**	**0.02**	**-0.05**
Delayed Amount	0.0009	0.0032	-0.0018	0.0032
	1.07	3.61	-2.95	3.04
	0.04	**0.13**	**-0.07**	**0.13**
Earlier Date	0.0038	0.0032	0.0072	0.0040
	2.62	2.00	4.78	2.28
	0.03	**0.02**	**0.05**	**0.03**
Delayed Date	-0.0002	-0.0005	-0.0002	-0.0003
	-1.42	-3.15	-2.18	-2.15
	-0.04	**-0.09**	**-0.04**	**-0.05**

Note: Each column reports the results of a linear mixed-effects regression. In each case, the dependent variable was the total time (in seconds) attending to the ROI, and the independent variables were a constant, the immediate monetary amount offered, the delayed monetary amount offered, and the delayed date. For each independent variable, coefficients and t-statistics from the regression are reported in the first two rows for each coefficient. For all independent variables, excluding the constant, a measure of effect size appears in bold in the third row. This effect size measures the average change in the amount of time (in seconds) attending to each ROI, as the corresponding variable increases from the minimum amount shown to participants to the maximum amount shown to participants.

Online Appendix Table 21

Impact of Attribute Values on Fixation Count				
	Earlier Amount	Delayed Amount	Earlier Date	Delayed Date
Constant	0.4950	0.4786	0.4603	0.5319
	9.68	15.51	14.39	11.14
Earlier Amount	0.0021	0.0004	0.0003	-0.0000
	20.86	7.40	7.15	-1.17
	0.02	**0.00**	**0.00**	**-0.00**
Delayed Amount	0.0003	0.0019	-0.0001	0.0003
	7.25	18.87	-2.92	5.17
	0.01	**0.08**	**-0.00**	**0.01**
Earlier Date	0.0004	-0.0000	0.0023	0.0004
	8.35	-0.85	22.36	7.37
	0.00	**-0.00**	**0.02**	**0.00**
Delayed Date	-0.0001	0.0003	0.0002	0.0018
	-2.51	7.13	5.57	17.48
	-0.01	**0.06**	**0.04**	**0.35**

Note: Each column reports the results of a linear mixed-effects regression. In each case, the dependent variable was the number of fixations made to the ROI, and the independent variables were a constant, the earlier monetary amount offered, the delayed monetary amount offered, the earlier date, and the delayed date. For each independent variable, coefficients and t-statistics from the regression are reported in the first two rows for each coefficient. For all independent variables, excluding the constant, a measure of effect size appears in bold in the third row. This effect size measures the average change in the number of fixations made to each ROI, as the corresponding variable increases from the minimum amount shown to participants to the maximum amount shown to participants.

Online Appendix Table 22

Impact of Attribute Values on Attention				
	Sooner Amount	Delayed Amount	Earlier Delay	Delayed Delay
Constant	0.273	0.142	0.243	0.344
	4.56	2.17	4.29	5.57
Earlier Amount	0.000	0.005	0.004	-0.008
	0.03	1.37	1.23	-2.57
	0.1%	**5.1%**	**4.0%**	**-9.1%**
Delayed Amount	-0.001	0.001	-0.003	0.003
	-1.13	0.61	-2.13	2.39
	-6.1%	**3.6%**	**-10.8%**	**13.3%**
Earlier Date	0.000	0.002	-0.003	-0.000
	0.04	0.48	-0.76	-0.11
	0.1%	**1.5%**	**-2.1%**	**-0.3%**
Delayed Date	0.000	-0.000	-0.000	0.000
	1.66	-1.75	-0.87	0.63
	6.5%	**-6.3%**	**-2.9%**	**2.4%**

Note: Each column reports the results of a linear mixed-effects regression. In each case, the dependent variable was the fraction of time attending to the ROI, and the independent variables were a constant, the earlier monetary amount offered, the delayed monetary amount offered, the earlier date, and the delayed date. Only the participant's first 3 trials were included in the analysis. For each independent variable, coefficients and t-statistics from the regression are reported in the first two rows for each coefficient. For all independent variables, excluding the constant, a measure of effect size appears in bold in the third row. This effect size measures the average change in the fraction of time attending to each ROI, as the corresponding variable increases from the minimum amount shown to participants to the maximum amount shown to participants.

Online Appendix Table 23

Impact of Attribute Values on Attention				
	Sooner Amount	Delayed Amount	Earlier Delay	Delayed Delay
Constant	0.248	0.140	0.297	0.317
	5.68	2.89	6.84	7.03
Earlier Amount	0.002	0.003	0.002	-0.007
	0.65	1.16	1.02	-2.96
	1.7%	**3.4%**	**2.6%**	**-8.0%**
Delayed Amount	-0.001	0.003	-0.004	0.003
	-1.09	1.73	-3.61	2.90
	-4.5%	**8.1%**	**-14.9%**	**12.7%**
Earlier Date	-0.002	0.003	-0.003	0.001
	-0.74	0.89	-0.96	0.39
	-1.5%	**2.1%**	**-2.0%**	**0.8%**
Delayed Date	0.000	-0.000	-0.000	0.000
	0.83	-1.75	-0.09	0.64
	2.6%	**-4.9%**	**-0.3%**	**2.0%**

Note: Each column reports the results of a linear mixed-effects regression. In each case, the dependent variable was the fraction of time attending to the ROI, and the independent variables were a constant, the earlier monetary amount offered, the delayed monetary amount offered, the earlier date, and the delayed date. Only the participant's first 5 trials were included in the analysis. For each independent variable, coefficients and t-statistics from the regression are reported in the first two rows for each coefficient. For all independent variables, excluding the constant, a measure of effect size appears in bold in the third row. This effect size measures the average change in the fraction of time attending to each ROI, as the corresponding variable increases from the minimum amount shown to participants to the maximum amount shown to participants.

Online Appendix Table 24

Impact of Attribute Values on Attention				
	Sooner Amount	Delayed Amount	Earlier Delay	Delayed Delay
Constant	0.242	0.212	0.218	0.320
	7.34	6.16	7.37	9.29
Earlier Amount	0.002	0.001	0.003	-0.006
	1.33	0.46	2.18	-3.28
	2.5%	**0.9%**	**3.7%**	**-6.5%**
Delayed Amount	-0.001	0.001	-0.002	0.002
	-1.98	1.71	-3.43	2.80
	-5.8%	**5.3%**	**-9.1%**	**8.9%**
Earlier Date	-0.002	0.000	0.000	0.002
	-1.09	0.06	0.17	0.77
	-1.6%	**0.1%**	**0.2%**	**1.2%**
Delayed Date	0.000	-0.000	-0.000	-0.000
	2.73	-1.12	-0.86	-0.56
	4.9%	**-2.4%**	**-1.5%**	**-1.1%**

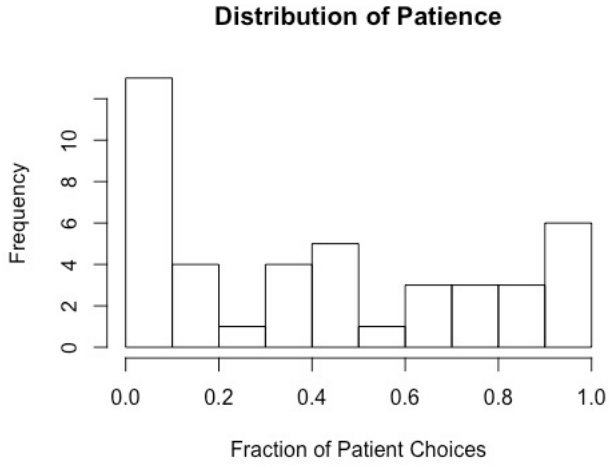
Note: Each column reports the results of a linear mixed-effects regression. In each case, the dependent variable was the fraction of time attending to the ROI, and the independent variables were a constant, the earlier monetary amount offered, the delayed monetary amount offered, the earlier date, and the delayed date. Only the participant's first 10 trials were included in the analysis. For each independent variable, coefficients and t-statistics from the regression are reported in the first two rows for each coefficient. For all independent variables, excluding the constant, a measure of effect size appears in bold in the third row. This effect size measures the average change in the fraction of time attending to each ROI, as the corresponding variable increases from the minimum amount shown to participants to the maximum amount shown to participants.

Online Appendix Table 25

		Stimulus Values			Patient Choice Frequency
Question Number	Question Type	Immediate Price	Delayed Price	Delayed Date	Study 4
1	Headphones	350	200	24	0.47
2	Headphones	350	220	21	0.44
3	Headphones	350	250	18	0.41
4	Headphones	350	260	15	0.46
5	Headphones	350	275	12	0.47
6	Headphones	350	285	10	0.45
7	Headphones	350	295	9	0.37
8	Headphones	350	300	8	0.26
9	Headphones	350	320	6	0.18
10	Headphones	350	330	3	0.16
11	Tablet	600	200	24	0.67
12	Tablet	600	250	21	0.65
13	Tablet	600	300	18	0.6
14	Tablet	600	350	15	0.6
15	Tablet	600	400	12	0.63
16	Tablet	600	450	10	0.64
17	Tablet	600	500	9	0.46
18	Tablet	600	525	8	0.34
19	Tablet	600	550	6	0.3
20	Tablet	600	580	3	0.14
21	Laptop	2000	1000	12	0.9
22	Laptop	2000	1100	10	0.9
23	Laptop	2000	1250	9	0.85
24	Laptop	2000	1400	8	0.73
25	Laptop	2000	1450	6	0.86
26	Laptop	2000	1500	5	0.81
27	Laptop	2000	1600	4	0.87
28	Laptop	2000	1750	3	0.79
29	Laptop	2000	1850	2	0.77
30	Laptop	2000	1950	1	0.31

Note: Stimulus values and fraction of patient choices for Study 4. Delay dates are in months and prices are in $s.

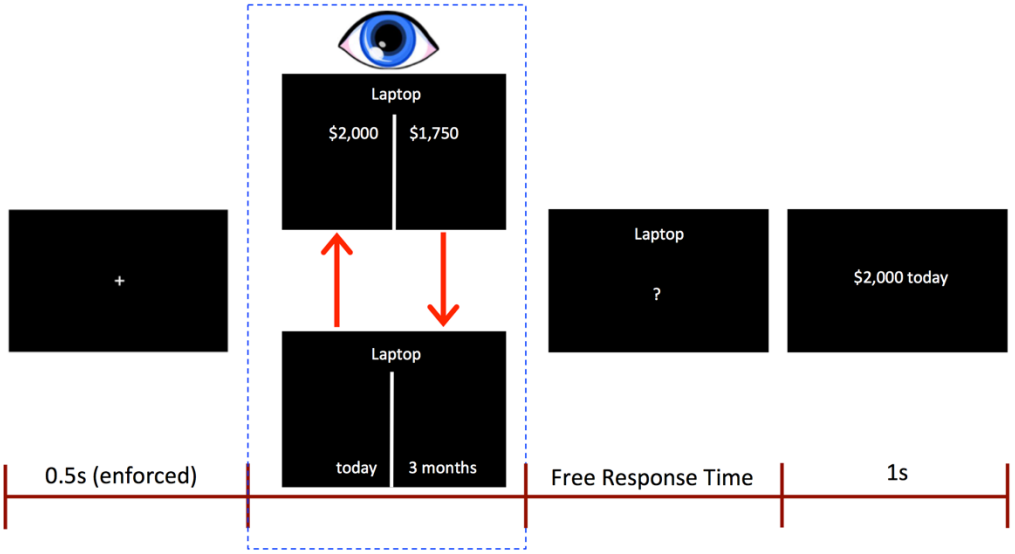
Online Appendix Figure 1



Note: Histogram of the fraction of patient choices in Study 1.

Online Appendix Figure 2

A



B

		Order	
		Prices 1st	Delays 1st
Length on Screen	Prices > Delays	1.5s **P** / 0.4s **D**	0.4s **D** / 1.5s **P**
	Delays > Prices	0.4s **P** / 1.5s **D**	1.5s **D** / 0.4s **P**

Design for Study 4. (A) Trial structure for choice task in Study 4. First, participants fixated on a central fixation cross for 500 ms. Next, they saw a screen with only the product name at the top. After looking at the product for 1s, participants saw a pair of screens that alternated for a fixed length of time, depending on which of the four conditions was implemented. After switching between the two screens for a minimum of 3.8s, participants were shown a question mark and had as long as they liked to enter a choice, but could only enter their response once they saw the question mark. Afterwards, feedback was shown for 1 second, and participants continued to the next trial. (B) Exposure structure for the four different conditions. Both the length that each screen appeared as well as its order was varied. Each experimental cell repeated itself in each trial so that the total exposure time was not less than 3.8 seconds, and could last longer depending on when the participant fixated to the attributes on the screen.

B. Online Appendix Study 1: Stimulus Perception

Studies 2, 3, and 4 manipulate attention using a variety of short exposure times for particular choice features. Although previous work suggests consumers are both able to process information in these short time exposures and make accurate decisions in relatively short durations (Milosavljevic et al., 2011), the previous results cannot rule out the explanation that participants were unable to process all the decision-relevant information. Additionally, while Study 4 tested participants' perception of the stimuli by asking them to make binary choices between possible choice sets, the number of trials were fairly limited and it was not clear to what extent the results can generalize to the Studies 2 and 3. Online Appendix Study 1 attempts to verify that participants were able to process all information on the screen, even when it appeared for short exposure times.

Methods. 23 participants made 72 decisions over whether they would prefer a smaller-sooner or larger-later monetary payment (Online Appendix Figure B1). Participants were paid $5 in cash as a show up fee, plus the payment associated with their response from one randomly chosen trial.

The presentation of each choice set combined elements from Studies 2-4 that were designed to test for a causal link between visual attention and intertemporal decision-making (Online Appendix Figure B1). As in Studies 2 and 4, attention was exogenously manipulated to the monetary amounts and delays for differing time periods: either by viewing the amounts for longer than delays or viewing the delays for longer than the amounts. These predetermined time lengths are listed in Online Appendix Figure B1and designed to be the same timing sequences as in Studies 2 through 4. They vary in the duration of shorter and longer enforced fixation durations, whether participants viewed each attribute once or twice, and whether both attributes were ever displayed at the same time. For instance, the first fixation manipulation condition, FM2, uses the timing from Study 2 so that participants viewed the choice set for a total of 5 seconds: 1 second on the short fixation attribute and 4 seconds on the long fixation attribute. Each participant faced 24 trials from FM2, FM3, and FM4 in a random order. Additionally, we randomized whether the amounts appeared for longer than delays, whether the amounts appeared first (for

FM2 and FM4), and whether the earlier option was displayed on the left or right-hand side of the screen. We counterbalanced this within participants so each participant saw an equal number of trials in all conditions, in a random order. Eye movements were recorded at 1000 Hz using an SR Research Eyelink 1000 Plus desktop-mounted eye tracker.

After participants fixated at the attributes for the predetermined amount of time, all stimuli disappeared from the screen and a question mark was shown in the center of the screen. As in the previous experiments, this was the participants' cue to enter their response for the trial, which they did by pressing one of two keys on the keyboard. After entering their response, participants did not see any feedback about what they chose, but were instead asked to report one of the three attributes that was allowed to vary across trials (i.e., "Please enter the monetary amount for the delayed option: $", "Please enter the time delay (in days) for the delayed option:", "Please enter the monetary amount for the immediate option: $"). Participants were asked to recall attributes that had appeared for the short fixation duration as well as those that appeared for the long fixation duration. If a participant entered a response that was not a number, they were asked to reenter their response until it was accepted.

After submitting their recall about the attribute value they were next asked, "How confident are you in your response?" Participants were instructed to enter a number from 1 (i.e., "not at all confident") to 9 (i.e., "as confident as possible"). After entering a response, participants proceeded to the next trial.

The questions (i.e., values of each attribute in a trial) each participant faced were chosen randomly for each participant from the set of all stimuli in Study 1 without replacement, meaning that each participant viewed a slightly different set of questions. However, we imposed the additional criteria that the earlier date was always immediate. As the primary motivation for this study centered on eliciting attribute values, we chose not to repeat identical trials with the same attribute values in the experiment. Participants were allowed to take a break every 15 trials. At the end of the task, one trial was chosen at random and implemented. All intertemporal choice payments were dispersed through PayPal, and at the

end of the experiment participants completed a brief questionnaire.[1] The average total payment was $29 (SD = $9).

Results

Accuracy. Online Appendix Figure B2 depicts the average fraction of correctly entered attribute values by fixation manipulation condition and whether the prompted attribute value was fixated to for a short or long duration. Several features are worth highlighting. First, participants answered 91.7% (SD = 8.1%) of all questions correctly, displaying a high level of accuracy in their recall of attribute values. Second, participants were equally accurate in their perception of attribute values regardless of whether they were asked to recall a variable that had been displayed for a short or long enforced fixation time (M_{short} = 0.92, SD_{short} = 0.09, M_{long} = 0.92, SD_{long} = 0.08; $t(22) = 0.32$, $p = 0.750$). Third, this relationship held within each fixation manipulation condition suggesting that participants in Studies 2 through 4 were equally able to assess attribute values for both short and long enforced fixations (FM2: $t(22) = 0.42$, $p = 0.678$, FM3: $t(22) = 1.31$, $p = 0.203$, FM4: $t(22) = 0.22$, $p = 0.824$)

Additionally, we investigated the average error of participant responses, i.e. the absolute difference between their response and the target attribute value. As we did not identify any previous differences in accuracy between short and long fixations or between fixation manipulation conditions, we conduct this analysis pooled across all treatment conditions. When participants were asked to enter a monetary amount, they entered a value that was $0.52 further from the true value on average (SD = $0.63). Additionally, when prompted for the delay date, participants entered a response 3.6 days apart

[1] As in the previous experiments, this questionnaire contained questions designed to get at whether participants believed their choices would truly affect their payments, whether they believed delayed payment promises, and whether they felt an experimenter demand effect. In the data 96% of participants believed their choices impacted their payments, 91% believed if they chose the delayed payment they would be paid at that later point in time, and 91% were making the choices they wanted to make without thinking about what the experimenters wanted. In an open ended response to the question "what do you believe this study is about," no participant made any reference to changes in attention across trials or that different trials had different attribute fixations lengths.

from the target date (SD = 3.9 days). As the range of future dates varied from 7 to 216 days, there appears to be a relatively low error for both monetary amounts and delay dates.

Overall, the evidence suggests that the ability for individuals to accurately perceive the attribute values is unaffected by the varying fixation durations utilized in Studies 2 through 4.

Confidence. Online Appendix Figure B2 depicts the average confidence values reported by fixation manipulation condition and whether the prompted attribute value was fixated to for a short or long duration. First, there was no overall difference in confidence between reported attribute values that had been fixated to for a short versus long time (M_{short} = 8.01, SD_{short} = 1.08, M_{long} = 8.11, SD_{long} = 1.03; $t(22) = 1.09$, $p = 0.286$). Second, while there were no differences in average confidence between FM2 and FM4 (M_{FM2} = 8.20, SD_{FM2} = 1.10; M_{FM4} = 8.16, SD_{FM4} = 1.04; $t(22) = 0.79$, $p = 0.44$) there were differences when both of these conditions were compared to FM3 (M_{FM3} = 7.83, SD_{FM3} = 1.04; FM3 vs. FM2: $t(22) = 3.60$, $p = 0.002$; FM3 vs. FM4: $t(22) = 3.93$, $p < 0.001$). These differences were driven largely by short rather than long enforced fixations (Short FM3 vs FM2: $t(22) = 4.45$, $p < 0.001$; Long FM3 vs. FM2: $t(22) = 1.04$, $p = 0.31$; Short FM3 vs. FM4: $t(22) = 3.93$, $p < 0.001$; Long FM3 vs. FM4: $t(22) = 2.24$, $p = 0.04$).

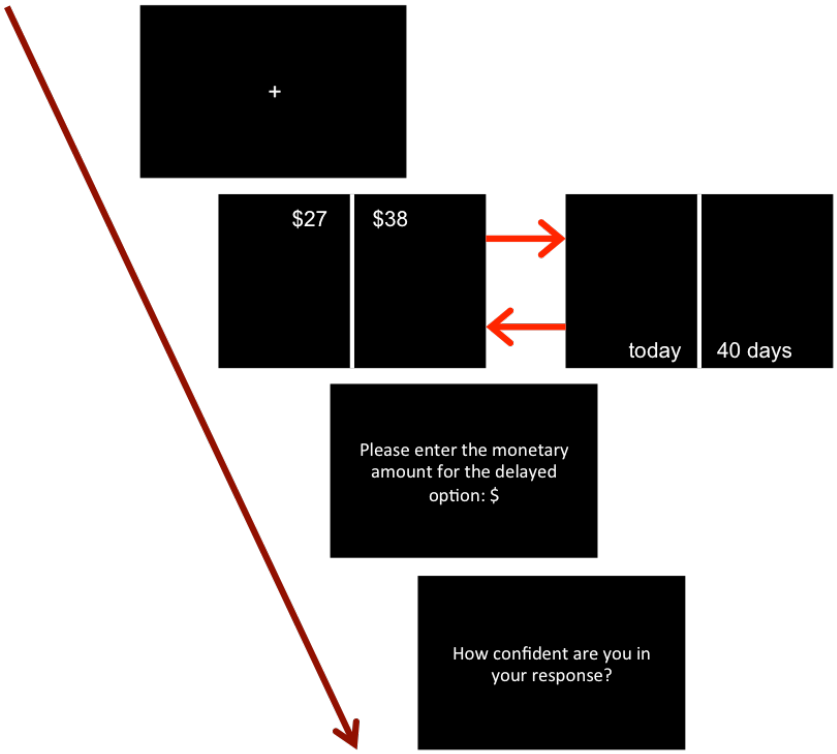
Although participants were able to accurately perceive the stimuli, they were less confident in their recall for exclusively the shortest duration stimuli that appeared for 300 milliseconds. This suggests that the shorter duration timing used in Study 3 might have allowed features to be mentally represented with more noise, even though the earlier results suggest they are not less accurately recalled compared to features displayed for the alternative times used.

Choices. Pooling across the three fixation manipulation conditions, we found that when participants were forced to attend to the monetary amounts more than the delays they made a patient choice 61.0% of the time (SD = 34.3%); however, they made patient choices 58.1% of the time (SD = 33.8%) after fixating to the delays for longer than the amounts ($t(22) = 2.02$, $p = 0.06$). Although we observed differences in the

number of patient choices between conditions, we failed to observe any significant differences in the estimated log(k) ($t(22) = 1.28$, $p = 0.215$). However, it is worth noting that this experiment was not designed to test for the causal impact of attention on choices, as the stimuli were randomly chosen from a larger set and a relatively low number of trials were used. Given this, it is not surprising we did not detect significant differences in the k parameter since this would depend on carefully chosen trial parameters and enough trials to detect differences. Moreover, to examine how well the hyperbolic model fit the choice data, we used the estimated k from choice prediction for every trial. We found this procedure correctly predicted observed choices in only 64.6% (SD = 31.0%) of trials.

Online Appendix Figure B1

A

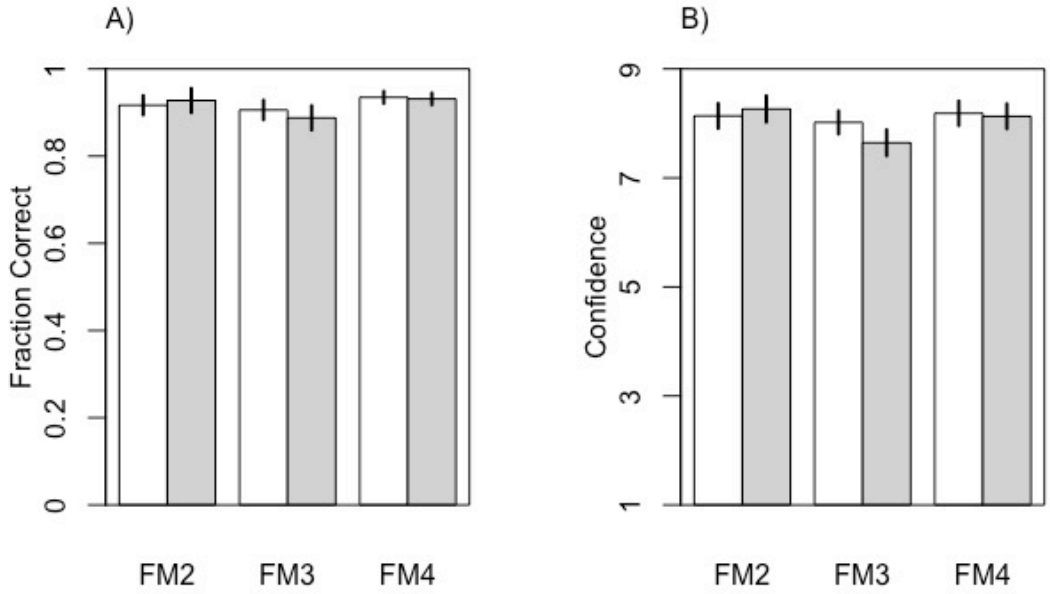


B

Fixation Manipulation	Replicates	Timing	Repeated	Free Viewing
FM2	Study 2	0.5 / 2.0	Yes	No
FM3	Study 3	0.3 / 1.2	No	Yes
FM4	Study 4	0.4 / 1.5	Yes	No

Design for Appendix Study 1. (A) Trial structure for choice task in Appendix Study 1. First, participants fixated on a central fixation cross for 500 ms. Next, they saw a screen that displayed attributes according the fixation manipulation condition. Afterwards, they made a decision when a question mark appeared at the center of the screen. They next entered the amount of a randomly chosen attribute value and then entered their confidence over this entry before continuing to the next trial. (B) Listing of the three fixation manipulation conditions from Studies 2-4.

Online Appendix Figure B2



Results for Appendix Study 1. (A) Reports the fraction of correctly entered attribute values and (B) confidence rating by fixation manipulation condition and duration of the enforced fixation. White bars represent the longer enforced fixation condition and grey bars represent the shorter enforced fixation condition. Standard errors are clustered by participant.

C. Appendix Study 2: Visual Salience

Studies 2, 3, and 4 manipulate attention using a variety of enforced fixation manipulations that use the eye tracker. A potential alternative method to manipulate attention is to alter low-level visual salience properties of choice features. The logic is that a saliency manipulation might increase total attention to a particular choice feature. This study was designed to test whether a simple salience manipulation could alter discount rates.

Methods. Forty participants made 120 decisions over whether they would prefer a smaller-sooner or larger-later monetary payment. They were paid $5 in cash as a show up fee, plus the payment associated with their response from one randomly chosen trial.

The 120 decisions they faced consisted of forty questions that were each displayed in three treatments intended to increase the visual saliency of certain features by altering their color (Online Appendix Figure C1). In the first treatment, designed to increase attention to the earlier date, the earlier date appeared in red while the other features appeared in white. In the second treatment, designed to increase attention to the delayed monetary amount, the delayed monetary amount appeared in red while the other features appeared in white. The third treatment was a baseline condition in which all features appeared in white. As in the previous studies, the order of trials was randomized by participant.

Participants were not explicitly informed that there were different types of trials and were allowed to take a short break every 25 trials. At the end of the task, the computer randomly selected a single trial that would be implemented. All payments were implemented as in the previous studies that utilized PayPal, and at the end of the experiment participants completed a brief questionnaire.[2] The average total payment was $33 (SD = $9).

[2] As in the previous experiment, this questionnaire contained questions designed to get at whether participants believed their choices would truly affect their payments, whether they believed delayed payment promises, and whether they felt an experimenter demand effect. In the data 90% of participants believed their choices impacted their payments, 88% believed if they chose the delayed payment they would be paid at that later point in time, and 85% were making the choices they wanted to make without thinking about what the experimenters wanted. In an

Several features of the experiment are worth highlighting. First, given the sizable individual variation in discount rates, we used a within participants design to increase statistical power as in Studies 2 and 3. Second, we manipulated the visual salience of the earlier date and the delayed monetary amount because the results of Study 1 suggest that these features may affect patience, given the asymmetric impact of fixating on the earlier delay versus the other features. Third, the attentional manipulation used here is likely to affect the order in which choice features are fixated. Namely, those features that are more visually salient are likely to be fixated earlier in the decision process and hence, this design has difficulty teasing apart differences in attention versus order effects. Fourth, and unlike Studies 2 through 4, the strength of the attentional manipulation is likely to vary across participants and trials. While there may be certain participants or trials in which a participant is susceptible to alterations in total attention due to low level property changes, it is possible that the effect may have little impact in other trials or for certain participants. As a result, there is uncertainty about the size of the relative attention difference that is generated by the different conditions. Finally, it is possible that other salience manipulations can have a more sizeable effect on choice than the color manipulation used here.

Results. We found that participants made 15.9 patient choices (SD = 12.1) when the delayed monetary amount was made visually salient and 15.1 patient decisions (SD = 12.0) when the earlier date was made visually salient ($t(39) = 2.32$, $p = 0.026$), which amounts to a 5% increase in the number of patient choices.[3] A similar result was found when we examined at the estimated discount rates: the estimated $\log(k)$ was -4.86 when the delayed monetary amount was visually salient and -4.61 when the

open ended response to the question "what do you believe this study is about," 8 participants referenced changes in font across trials; however, the results below hold when excluding these participants from analysis.

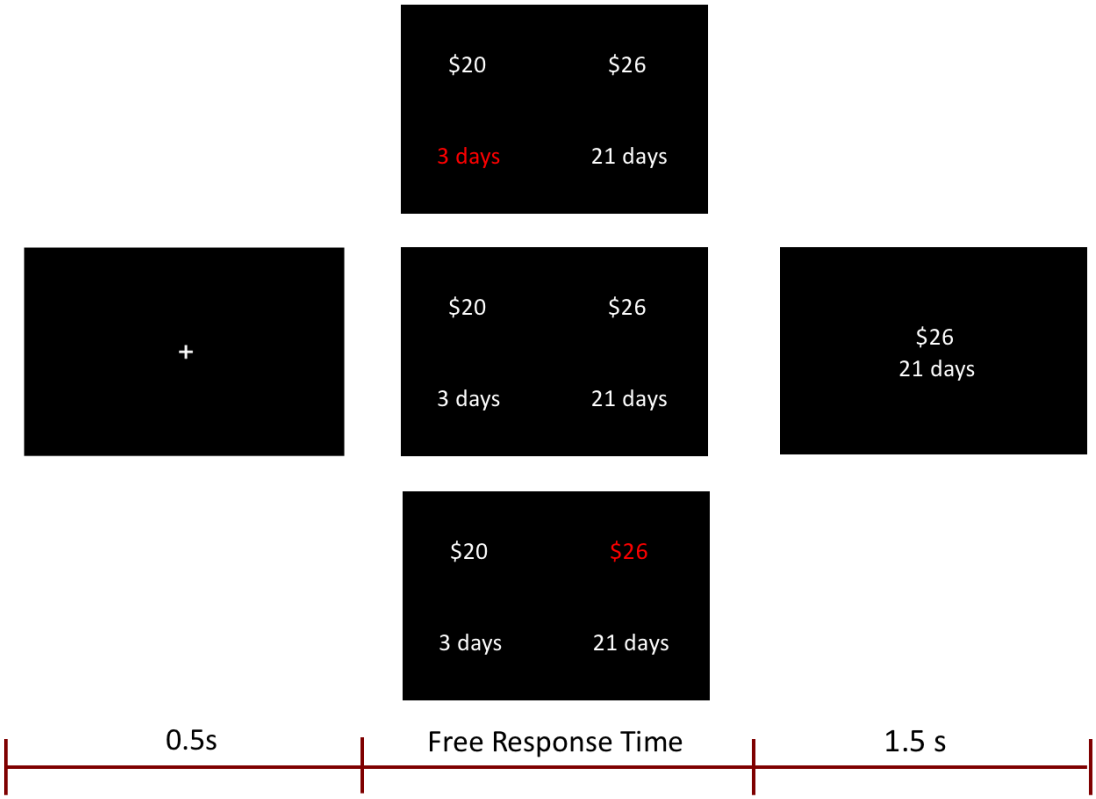
[3] As participants exhibited a range of patient behavior and since it may be difficult to nudge the behavior of those participants who opted to choose patiently or impatiently for the majority of trials, we sought to examine how the manipulation biased those participants who displayed an intermediary level of patience. 22 participants chose patiently greater than 20% of the time but less than 80% of the time and the fixation manipulation had a similar effect among this subgroup. These participants made 19.9 patient choices (SD = 8.4) when the delayed monetary amount was visually salient, and 18.8 patient choices (SD = 7.7) when the earlier date was visually salient ($t(21) = 1.94$, $p = 0.066$; $SD_{Diff} = 2.6$). This amounts to a 6% increase in the number of patient choices.

earlier date was visually salient ($t(39) = 2.40$, $p = 0.021$). The direction of these effects was consistent with the predictions made based on the findings of Study 1.

Moreover, in the baseline condition participants made 15.2 patient decisions (SD = 12.1) which suggests that increasing the visual salience of the delayed monetary amount increased patience relative to a baseline ($t(39) = 2.63$, $p = 0.012$), but that increasing the visual salience of the earlier date did not alter patience relative to a baseline ($t(39) = 0.37$, $p = 0.712$). We found less of an impact on discount rates as the estimated $\log(k)$ was -4.79 in the baseline (baseline vs. delayed monetary amount as visually salient: $t(39) = 1.10$, $p = 0.277$; baseline vs. earlier delay as visually salient: $t(39) = 1.88$, $p = 0.068$).

To examine how well the hyperbolic model fit the choice data, we estimated and used k from each condition to make a choice prediction for every trial. We found this procedure was consistent with observed choice in 87.6% (SD = 9.4%) of trials, suggesting the model accurately fits the data.

Appendix Figure C1



Trial structure for Appendix Study 2. Every trial, participants first saw a central fixation cross for 500ms. Afterwards, the choice set was revealed and participants had as long as they liked to make a choice between an option to be received earlier and an option to be received at some later date. Each participant saw three types of trials: either the earlier delay was written with red text, the later monetary amount was written with red text, or no red text was used on any choice feature. After entering a response, participants saw feedback for 1.5 seconds, and then moved to the next trial.