In these pages, we explain experimental details and give additional results and derivations.

1. Formulation of the PE question for a gauge duration of 38 years[1]

Suppose that you suffer from a hormonal disease. Your disease, although uncommon, is well-known. After a few weeks, this disease will reduce your quality of life, and you will be in health state A. This disease will also affect your life duration, in such a way that you may expect to live another 38 years. If you want to avoid that your health gets worse, you can receive a medical treatment. There are two possible outcomes from treatment. Either your health recovers for some years or you die (because your metabolism may reject the treatment). Patients for whom the treatment is successful may expect to live for 38 years in good health.

You have to choose between two alternatives:

a) Alternative 1: Starting the treatment.

b) Alternative 2: Not starting the treatment. You may expect to live for 38 years in health state A.

In this study we want to know whether you would choose alternative 1 or alternative 2. To make your choice you need to know the success and failure probabilities of alternative 1 (the treatment). Assume that those probabilities are 1% and 99%, respectively (remember: the sum of success and failure probabilities is always equal to 100%). Hence, your choice is between:

Alternative 1				Alternative 2
Success probability p (%)	Success: Years in good health	Failure probability 1-p (%)	Failure: Years alive	Years in health state A
1	38	99	0	38

Which alternative do you prefer? (*Write the alternative you prefer*): ……………………

Assume now that probabilities are 99% and 1% respectively. Hence your choice is between:

Alternative 1				Alternative 2
Success probability p (%)	Success: Years in good health	Failure probability 1-p (%)	Failure: Years alive	Years in health state A
99	38	1	0	38

Which alternative do you prefer? (*Write the alternative you prefer*): ……………………

Next, we will display several choices between alternative 1 and alternative 2. Probabilities of success and failure of alternative 1 will change from one choice to another. You have to determine the probabilities of success and failure for which you consider alternative 1 (treatment) and alternative 2 (no treatment) equivalent.

1) Would you choose the treatment for probabilities 50%-50%?

   (answer YES or NO): …….

2) If your answer is YES, go to Table 1 and follow the instructions. If your answer is NO, go to Table 2 and follow the instructions.

Table 1: You have chosen Alternative 1 for a 50% chance of success

If you choose an alternative under which appears STOP, mark this word with a circle and complete the sentence below the table. If you choose an alternative under which appears CONTINUE, mark this word with a circle and go to the next line.

[1] This is the translated version of the original instructions, which were written in Spanish.

	Alternative 1				Alternative 2	I choose		
Line	Success probability p (%)	Success: Years in good health	Failure probability 1-p (%)	Failure: Years alive	Years in health state A	Alt. 1	Indifference between 1 and 2	Alt. 2
1	49	38	51	0	38	Continue	Stop	Stop
2	1	38	99	0	38	Stop	Stop	Continue
3	39	38	61	0	38	Continue	Stop	Stop
4	11	38	89	0	38	Stop	Stop	Continue
5	29	38	71	0	38	Continue	Stop	Stop
6	21	38	79	0	38	Stop	Stop	Stop

I am indifferent between alternative 1 and alternative 2 when the success probability is......% and the failure probability is........%

Table 2: You have rejected Alternative 1 for a 50% chance of success

If you choose an alternative under which appears STOP, mark this word with a circle and complete the sentence below the table. If you choose an alternative under which appears CONTINUE, mark this word with a circle and go to the next line.

	Alternative 1				Alternative 2	I choose		
Line	Success probability p (%)	Success: Years in good health	Failure probability 1-p (%)	Failure: Years alive	Years in health state A	Alt. 1	Indifference between 1 and 2	Alt. 2
1	49	38	51	0	38	Stop	Stop	Continue
2	99	38	1	0	38	Continue	Stop	Stop
3	59	38	41	0	38	Stop	Stop	Continue
4	89	38	11	0	38	Continue	Stop	Stop

5	69	38	31	0	38	Stop	Stop	Continue
6	79	38	21	0	38	Stop	Stop	Stop

I am indifferent between alternative 1 and alternative 2 when the success probability is......% and the failure probability is........%

2. P-values for the paired comparisons

Tables 3 and 4 show the P values for all the pairwise comparisons that we performed for health states A and B, respectively. The entries of Table 6 in the paper and of Table 7 below are based on these two tables.

Table 3: P values for the paired comparisons for health state A

Gauge Duration	PE-CE	PE-VE	PE-PLE	PE-VLE	CE-VE	CE-PLE	CE-VLE	VE-PLE	VE-VLE	PLE-VLE
EU-Linear										
13	<0.001	<0.001	<0.001	<0.001	<0.001	0.827	0.036	<0.001	<0.001	0.074
24	0.040	0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.632
38	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.429
EU-Power										
13	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	0.556	<0.001
24	<0.001	<0.001	<0.001	0.262	<0.001	<0.001	<0.001	<0.001	0.115	<0.001
38	<0.001	<0.001	<0.001	0.086	<0.001	<0.001	0.373	<0.001	<0.001	<0.001
PT-TK										
13	0.193	<0.001	<0.001	0.029	0.002	<0.001	0.171	<0.001	0.114	<0.001
24	0.007	<0.001	<0.001	0.004	0.239	<0.001	0.712	<0.001	0.338	<0.001
38	<0.001	<0.001	<0.001	0.013	0.149	<0.001	0.132	<0.001	0.011	<0.001
PT-Opt										
13	<0.001	<0.001	<0.001	0.028	0.359	0.208	0.538	0.627	0.122	0.208
24	<0.001	0.001	<0.001	<0.001	0.25	0.869	0.608	0.551	0.256	0.612
38	<0.001	<0.001	<0.001	<0.001	0.363	0.494	0.079	0.338	0.064	0.439
RDU										
13	<0.001	<0.001	<0.001	0.009	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
24	0.498	0.004	<0.001	<0.001	<0.001	<0.001	0.008	<0.001	0.042	<0.001
38	0.719	0.003	<0.001	<0.001	0.004	<0.001	<0.001	0.498	<0.001	<0.001
DA										
13	<0.001	<0.001	0.926	0.015	<0.001	<0.001	<0.001	0.003	0.247	0.023
24	0.003	<0.001	0.085	<0.001	<0.001	<0.001	<0.001	0.137	0.177	<0.001
38	<0.001	<0.001	0.113	<0.001	<0.001	<0.001	<0.001	0.022	0.800	0.009
Diecidue et al.										
13	<0.001	<0.001	0.483	<0.001	<0.001	<0.001	<0.001	0.220	0.431	0.006
24	0.006	<0.001	0.547	<0.001	<0.001	0.013	<0.001	0.031	0.551	0.001
38	<0.001	<0.001	0.608	0.005	<0.001	0.011	<0.001	<0.001	0.054	0.072

Bleichrodt & Schmidt										
13	<0.001	<0.001	0.369	0.805	<0.001	<0.001	<0.001	<0.001	0.001	0.377
24	0.003	0.001	0.414	0.642	<0.001	0.069	0.003	0.001	0.019	0.150
38	<0.001	<0.001	0.256	0.528	<0.001	0.427	0.090	<0.001	<0.001	0.429

Table 4: P values for the paired comparisons for health state B

Gauge Duration	PE-CE	PE-VE	PE-PLE	PE-VLE	CE-VE	CE-PLE	CE-VLE	VE-PLE	VE-VLE	PLE-VLE
EU-Linear										
13	0.003	0.040	<0.001	<0.001	0.001	0.232	0.037	<0.001	<0.001	0.130
24	<0.001	0.717	<0.001	<0.001	0.032	<0.001	<0.001	<0.001	<0.001	0.397
38	<0.001	0.073	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.731
EU-Power										
13	0.001	0.072	<0.001	0.454	0.001	0.011	0.002	<0.001	0.302	<0.001
24	<0.001	0.894	<0.001	0.926	0.067	<0.001	0.004	<0.001	0.764	<0.001
38	<0.001	0.125	<0.001	0.029	0.001	<0.001	0.883	<0.001	0.001	<0.001
PT-TK										
13	0.100	0.074	<0.001	0.024	0.926	<0.001	0.650	<0.001	0.658	<0.001
24	0.029	0.823	<0.001	0.502	0.488	<0.001	0.282	<0.001	0.926	<0.001
38	<0.001	0.085	<0.001	0.317	0.145	<0.001	0.010	<0.001	0.502	<0.001
PT-Opt										
13	0.010	0.081	0.079	<0.001	0.454	0.258	0.523	0.943	0.203	0.083
24	0.016	0.866	0.531	0.003	0.195	0.125	0.258	0.559	0.041	0.002
38	<0.001	0.130	0.185	0.012	0.674	0.814	0.334	0.806	0.060	0.020
RDU										
13	<0.001	<0.001	0.001	0.334	0.377	<0.001	<0.001	0.002	<0.001	<0.001
24	0.422	0.339	0.001	0.385	0.312	0.003	0.109	<0.001	0.102	0.054
38	0.245	0.530	0.001	0.010	0.823	0.001	0.010	0.038	0.002	0.245
DA										
13	0.003	0.053	<0.001	<0.001	0.002	<0.001	<0.001	0.089	0.154	0.996
24	<0.001	0.926	0.285	<0.001	0.057	0.002	<0.001	0.516	0.011	<0.001
38	<0.001	0.128	0.218	0.046	0.001	0.004	<0.001	0.970	0.272	0.063
Diecidue et al.										
13	0.002	0.098	0.139	0.05	0.001	0.001	<0.001	0.814	0.764	0.722
24	<0.001	0.909	0.913	0.003	0.022	0.005	<0.001	0.996	0.078	0.008
38	<0.001	0.078	0.581	0.023	<0.001	0.007	<0.001	0.267	0.267	0.026
Bleichrodt & Schmidt										
13	0.002	0.083	0.810	0.574	0.001	0.011	0.014	0.142	0.027	0.714
24	<0.001	0.978	0.480	0.495	0.055	0.045	0.011	0.723	0.831	0.516
38	<0.001	0.148	0.304	0.148	0.001	0.292	0.502	0.015	0.022	0.883

3. Results and details of the auxiliary analyses

To operationalize rank-dependent utility, we assumed that probability weighting could be modeled by Eq. 4 in the main text (the formula proposed by Tversky and Kahneman (1992)). To operationalize Diecidue et al.'s (2004) model, we assumed that $V(Q,T) = \alpha U(Q,T)$. We also tried several other specifications, but this specification yielded the best fit among those that ensure that $V(\text{Death}) = 0$. To capture the common violation of expected utility, we must have $\alpha > 1$. To operationalize the model of Bleichrodt and Schmidt (2002), we assumed that $V(Q,T) = (U(Q,T))^{\alpha}$. We normalized U and V on [0,1], which implies that V is more concave than U when $\alpha < 1$ and U is more concave than V when $\alpha > 1$. To capture the most common violations of expected utility, we must have $\alpha < 1$.

The formulas for H(Q) under rank-dependent utility, disappointment aversion, and the two gambling effect models are in Table 5. Let us next explain how we derived the entries of table 5.

If the reference point is Death, then rank-dependent utility is isomorphic to prospect theory. Hence, the utilities for rank-dependent utility for the CE, PLE, and the VLE are equal to thos derived in the paper for prospect theory with reference point death. Disappointment aversion is the special case of rank-dependent utility where $w^+(p) = \frac{p}{1+(1-p)\delta}$. For the risk-risk methods, the gambling effect models coincide with expected utility. In Bleichrodt and Schmidt's (2002) gambling effect model, we need to normalize utilities on [0,1]. Hence, we set $L(38) = 1$ in that model.

First consider the PE. Under rank-dependent utility we obtain $H(Q)T^{\beta} = w^+(p)T^{\beta}$ and, hence, $H(Q) = w^+(p)$. Under Diecidue et al.'s (2004) gambling effect model, we obtain $\alpha(H(Q)T^{\beta}) = pT^{\beta}$. Rearranging gives $H(Q) = \frac{p}{\alpha}$. Bleichrodt and Schmidt's (2002) gambling effect model gives $(H(Q)(T/38)^{\beta})^{\alpha} = p\big((T/38)^{\beta}\big)^{\alpha}$, or $H(Q) = (p)^{1/\alpha}$. For the CE, we obtain under Diecidue et al.'s (2004) gambling effect model that $\alpha(H(Q)T_{ce}^{\beta}) = pT^{\beta}$. Rearranging gives $H(Q) = \frac{p'}{\alpha}(\frac{T}{T_{ce}})^{\beta}$. Bleichrodt and Schmidt's (2002) gambling effect model gives $(H(Q)(T_{ce}/38)^{\beta})^{\alpha} = p\big((T/38)^{\beta}\big)^{\alpha}$, or

$H(Q) = (p)^{1/\alpha}(\frac{T}{T_{ce}})^{\beta}$. For the VE, we have under rank-dependent utility, $H(Q)T^{\beta} = w^{+}(p)T_{ve}^{\beta}$, or $H(Q) = p(\frac{T_{ve}}{T})^{\beta}$. Under Diecidue et al.'s (2004) gambling effect model, we obtain $\alpha(H(Q)T^{\beta}) = p\ T_{ve}^{\beta}$. Rearranging gives $H(Q) = \frac{p}{\alpha}(\frac{T_{ve}}{T})^{\beta}$. Bleichrodt and Schmidt's (2002) gambling effect model gives $(H(Q)(T/38)^{\beta})^{\alpha} = p\big((T_{ve}/38)^{\beta}\big)^{\alpha}$, or $H(Q) = (p)^{1/\alpha}(\frac{T_{ve}}{T})^{\beta}$.

Table 5: Utilities under rank-dependent utility (RDU), disappointment aversion (DA), and the two gambling effect models

	PE	CE	VE	PLE	VLE
RDU	$w^{+}(p)$	$w^{+}(p)(\frac{T}{T_{ce}})^{\beta}$	$w^{+}(p)(\frac{T_{ve}}{T})^{\beta}$	$\frac{w^{+}(r)}{w^{+}(0.35)}$	$(\frac{T_{vle}}{T})^{\beta}$
DA	$\frac{p}{1+(1-p)\delta}$	$\frac{p}{1+(1-p)\delta}(\frac{T}{T_{ce}})^{\beta}$	$\frac{p}{1+(1-p)\delta}(\frac{T_{ve}}{T})^{\beta}$	$\frac{r(1+0.65\delta)}{0.35(1+(1-r)\delta)}$	$(\frac{T_{vle}}{T})^{\beta}$
DSW	$\frac{p}{\alpha}$	$\frac{p}{\alpha}(\frac{T}{T_{ce}})^{\beta}$	$\frac{p}{\alpha}(\frac{T_{ve}}{T})^{\beta}$	$\frac{r}{0.35}$	$(\frac{T_{vle}}{T})^{\beta}$
BS	$p^{1/\alpha}$	$p^{1/\alpha}(\frac{T}{T_{ce}})^{\beta}$	$p^{1/\alpha}(\frac{T_{ve}}{T})^{\beta}$	$\frac{r}{0.35}$	$(\frac{T_{vle}}{T})^{\beta}$

Note: RDU stands for rank-dependent utility, DA for disappointment aversion, DSW for the gambling effect model of Diecidue et al. (2004), and BS for the gambling effect model of Bleichrodt and Schmidt (2002)

Table 6 shows the medians of the individual parameter estimates under each of the four theories.[2] The degree of probability weighting under rank-dependent utility was similar to other studies using health outcomes (Bleichrodt and Pinto 2000). The estimates for Gul's theory of disappointment aversion indicate strong degrees of disappointment aversion. The parameter estimate for α in Diecidue et al.'s (2004) and Bleichrodt and Schmidt's gambling effect models

[2] In the iterations, α and β varied between 0.05 and 2, γ between 0.25 and 2, and δ between -1 and 10.

are according to expectation. The degree of utility curvature varies across the models from strongly concave under rank-dependent utility to slightly convex under disappointment aversion.

Table 6: Medians of the individual parameter estimates under rank-dependent utility, disappointment aversion, and the two gambling effect models

	Health state A			**Health state B**		
Model **Duration**	**13**	**24**	**38**	**13**	**24**	**38**
Rank-dependent utility						
γ	0.79	0.71	0.71	0.79	0.74	0.73
β	0.49	0.50	0.58	0.58	0.53	0.60
Disappointment av.						
δ	1.20	3.10	3.80	2.40	2.30	2.90
β	0.84	1.03	1.15	1.10	0.91	1.14
Gambling-effect models						
Diecidue et al.						
α	1.26	1.56	1.56	1.53	1.55	1.66
β	0.60	0.80	0.93	0.89	0.80	0.93
Bleichrodt & Schmidt						
α	0.70	0.50	0.45	0.68	0.58	0.56
β	0.81	0.95	1.00	0.95	0.93	1.01

Table 7 shows the number of significant pairwise differences between the five methods. None of the theories fitted the data as well as prospect theory with the optimal parameters, although the number of significant pairwise differences was also relatively low under Bleichrodt and Schmidt's (2002) gambling effect model, in particular for health state B.

Table 7: Number of significant pairwise differences between the methods for rank-dependent utility, disappointment aversion, and the two gambling effect models based on median parameters and a significance level of 1%

	Health state A			Health state B		
Model / **Duration**	**13**	**24**	**38**	**13**	**24**	**38**
Rank-Dep. Utility	10	8	8	8	3	3
Disappointment Av.	6	7	7	6	5	4
Diecidue et al.	7	7	6	5	5	4
Bleichrodt & Schmidt	7	5	5	2	1	2

Table 8 shows the results of the analysis of the individual data where we imposed on each subject the median optimal estimates and then examined for each subject and for each health state-gauge duration pair which of the theories fitted his data best. The table shows that prospect theory with the optimal parameters was the theory that was most consistent with the individual subject data.

Table 8: Proportion of individuals for whom a particular model fitted best in terms of the sum of squared residuals based on the median parameter estimates

Model / Health state	EU linear	EU power	PT TK	PT opt	RDU	DA	DSW	BS
A, 13 years	12.7	20.6	4.8	31.7	9.5	0	19.0	1.6
A, 24 years	7.9	15.9	9.5	38.1	9.5	4.8	9.5	4.8
A, 38 years	4.8	4.8	12.7	44.4	7.9	7.9	9.5	6.3
B, 13 years	8.7	15.2	2.2	36.7	4.3	23.9	2.2	6.5
B, 24 years	2.2	17.4	4.3	34.8	15.2	13.0	6.5	6.5
B, 38 years	0	13.0	2.2	39.1	15.2	8.7	10.9	10.9

4. Extra figures

Figures 1 to 4 show the median utilities for both health states and the three gauge durations under rank-dependent utility, disappointment aversion, and the gambling effect models by Diecidue et al. (2004) and Bleichrodt and Schmidt (2002). The figures show that under these theories some systematic inconsistencies remain, although more so for health state A than for health state B. The five methods are particularly close for health state B and Bleichrodt and Schmidt's gambling effect model.

Figure 1: Median Utilities under Rank-Dependent Utility

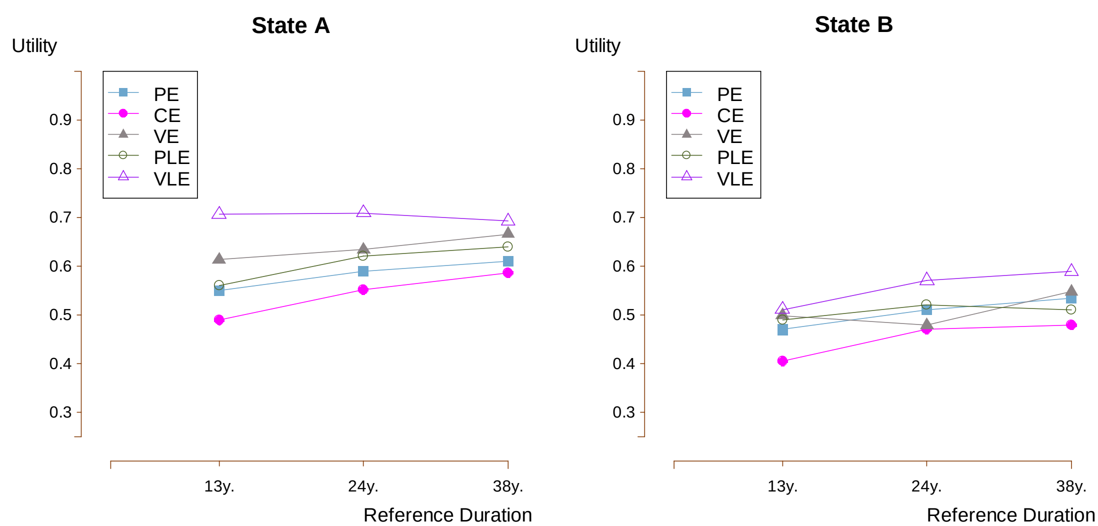

Figure 2: Median Utilities under Disappointment Aversion

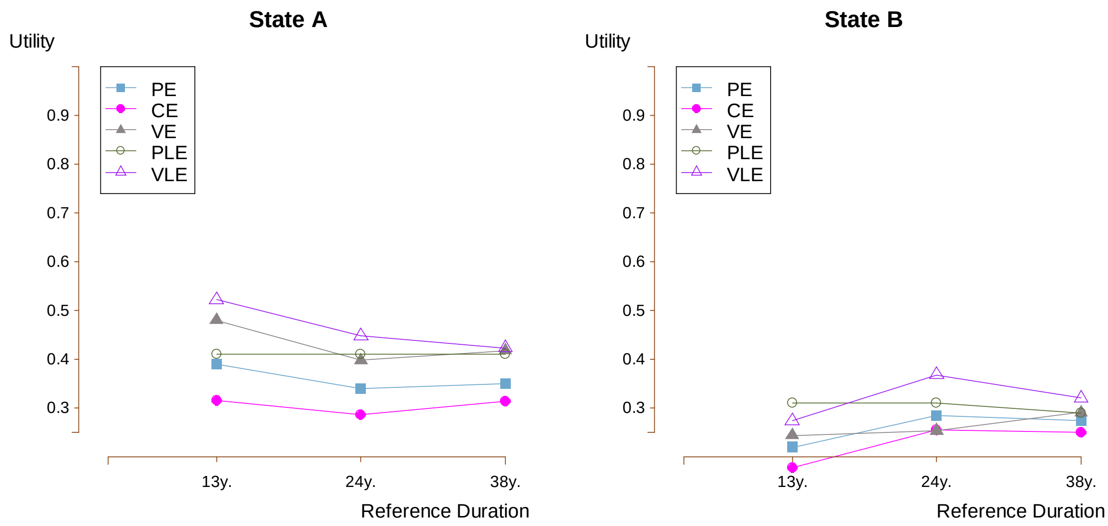

Figure 3: Median Utilities under Diecidue et al.'s gambling effect model

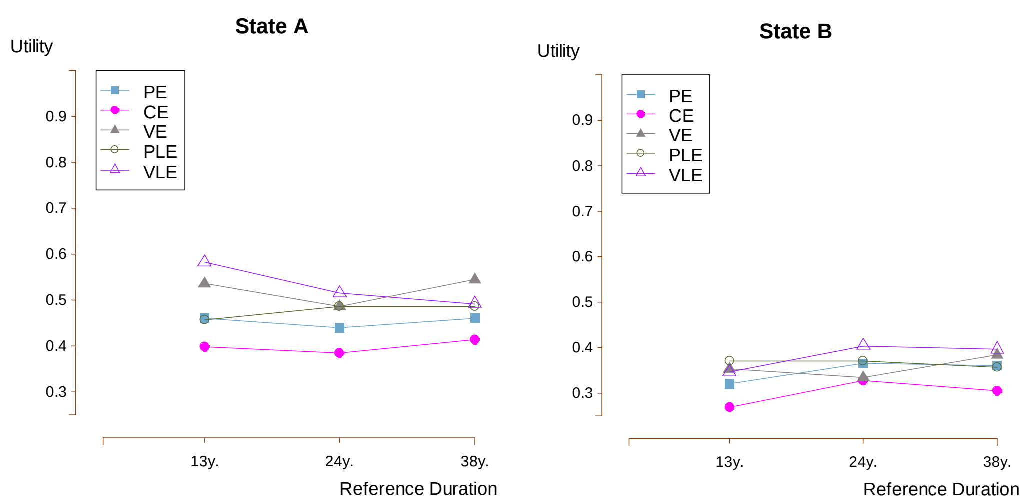

Figure 4: Median Utilities under Bleichrodt and Schmidt's gambling effect model