Appendix

1. Measures for monetary delay discounting

This project utilized an abbreviated version of the Monetary Choice Questionnaire-36 (MCQ-36) that was adapted for repeated administration on a mobile phone app. Adaptations included shortening the overall length of the questionnaire by administering only the 12 items in the large category, and creating six alternative sets of items in order to prevent rote participant responses. The MCQ-36 items from the large category were used as a base for the new items, with the following two adjustments: (1) The delayed options ranged continuously from $70-$99, rather than being $75, $80, or $85; (2) The duration of the delay was reduced to a maximum of 90 days, instead of 162 days. **Table 1a** summarizes the ranges for the reward amounts and the duration of delays for the delayed option that were associated with each k-value (1/days).

Table 1a. Base k-values and associated ranges for the reward amounts and duration of the delays for the delayed option for the mobile version of the MCQ

Base K-value (1/days)	Delayed rewards	Duration of delays (days)
0.0020	95-100	78 to 90
0.0040	95-100	66 to 78
0.0080	90-95	54 to 66
0.0160	90-95	45 to 54
0.0320	85-90	36 to 45
0.0640	85-90	27 to 36
0.1280	80-85	21 to 27
0.2560	80-85	15 to 21
0.5120	75-80	9 to 15
1.0240	75-80	6 to 9
2.0480	70-75	3 to 6
4.0960	70-75	1 to 4

The amount of the delayed rewards and the duration of the delays were randomly selected from the respective ranges. The associated amount of the immediate reward was computed using the following formula: Immediate reward = delayed reward / (1+k) * delay and rounded to the nearest whole number. **Table 1b** shows the resulting 12 items for each of the six

versions of the MCQ. The 12 items within each set were presented in random order. The order in which the six alternate versions were administered was also random across the 28-day study period.

Table 1b. Six sets of 12-item scales developed for EMA assessment.

Set	Base K-value (1/days)	Immediate rewards	Delayed rewards	Duration of delays (days)
1	0.0020	84	99	87
	0.0040	73	96	77
	0.0080	65	93	54
	0.0160	50	90	49
	0.0320	40	86	36
	0.0640	27	87	34
	0.1280	19	84	27
	0.2560	14	80	19
	0.5120	10	78	13
	1.0240	9	79	8
	2.0480	8	74	4
	4.0960	5	73	3
2	0.0020	83	98	90
	0.0040	74	95	69
	0.0080	62	92	61
	0.0160	54	94	46
	0.0320	39	86	38
	0.0640	27	89	36
	0.1280	22	85	23
	0.2560	14	80	18
	0.5120	12	77	11
	1.0240	11	76	6
	2.0480	7	74	5
	4.0960	8	72	2
3	0.0020	82	96	87
	0.0040	75	97	72
	0.0080	65	95	57
	0.0160	53	91	45
	0.0320	39	85	36
	0.0640	27	89	36
	0.1280	21	85	24
	0.2560	16	81	16
	0.5120	11	79	12
	1.0240	8	76	7
	2.0480	10	71	3

	4.0960	8	75	2
4	0.0020	83	97	87
	0.0040	74	95	70
	0.0080	64	92	54
	0.0160	50	90	51
	0.0320	40	89	38
	0.0640	29	87	31
	0.1280	19	84	26
	0.2560	16	80	16
	0.5120	12	79	11
	1.0240	9	77	7
	2.0480	7	75	5
	4.0960	5	70	3
5	0.0020	82	95	79
	0.0040	75	98	76
	0.0080	61	90	60
	0.0160	51	94	53
	0.0320	38	85	39
	0.0640	27	89	35
	0.1280	22	82	21
	0.2560	16	82	16
	0.5120	10	79	14
	1.0240	9	80	8
	2.0480	6	75	6
	4.0960	5	72	3
6	0.0020	84	99	90
	0.0040	75	96	70
	0.0080	65	94	55
	0.0160	50	92	53
	0.0320	36	88	45
	0.0640	29	89	32
	0.1280	21	85	24
	0.2560	14	83	19
	0.5120	11	77	12
	1.0240	10	79	7
	2.0480	7	74	5
	4.0960	8	71	2

2. Validity of MCQ responses

Table 2. The association of valid responses with time since substance use and being intoxicated

Substances	Valid MCQ responses	p-value
Time since last use	n (%)	
Any substance use		0.506
<1 hour ago	718 (90.4)	
1-2 hours ago	542 (89.1)	
2-4 hours ago	271 (86.2)	
4-6 hours ago	137 (91.3)	
None in the past 6 hours	1694 (92.2)	
Stimulant use		0.623
<1 hour ago	457 (90.3)	
1-2 hours ago	352 (88.9)	
2-4 hours ago	220 (83.7)	
4-6 hours ago	97 (88.2)	
None in the past 6 hours	2246 (92.0)	
Alcohol use		0.722
<1 hour ago	273 (8836)	
1-2 hours ago	210 (92.5)	
2-4 hours ago	148 (83.6)	
4-6 hours ago	56 (88.9)	
None in the past 6 hours	2685 (91.3)	
Marijuana use		0.550
<1 hour ago	255 (87.9)	
1-2 hours ago	214 (89.5)	
2-4 hours ago	136 (85.5)	
4-6 hours ago	57 (91.9)	
None in the past 6 hours	2710 (91.4)	
Being intoxicated	Beta (SE)	
Stimulant use	-0.03 (0.12)	0.772
Alcohol use	-0.06 (0.04)	0.067
Marijuana use	-0.04 (0.03)	0.123

p-value was estimated using generalized mixed effects model.