Supplemental Figures and Tables

Long-Term Deficits in Risky Decision-Making after Traumatic Brain Injury on a Rat Analog of the Iowa Gambling Task

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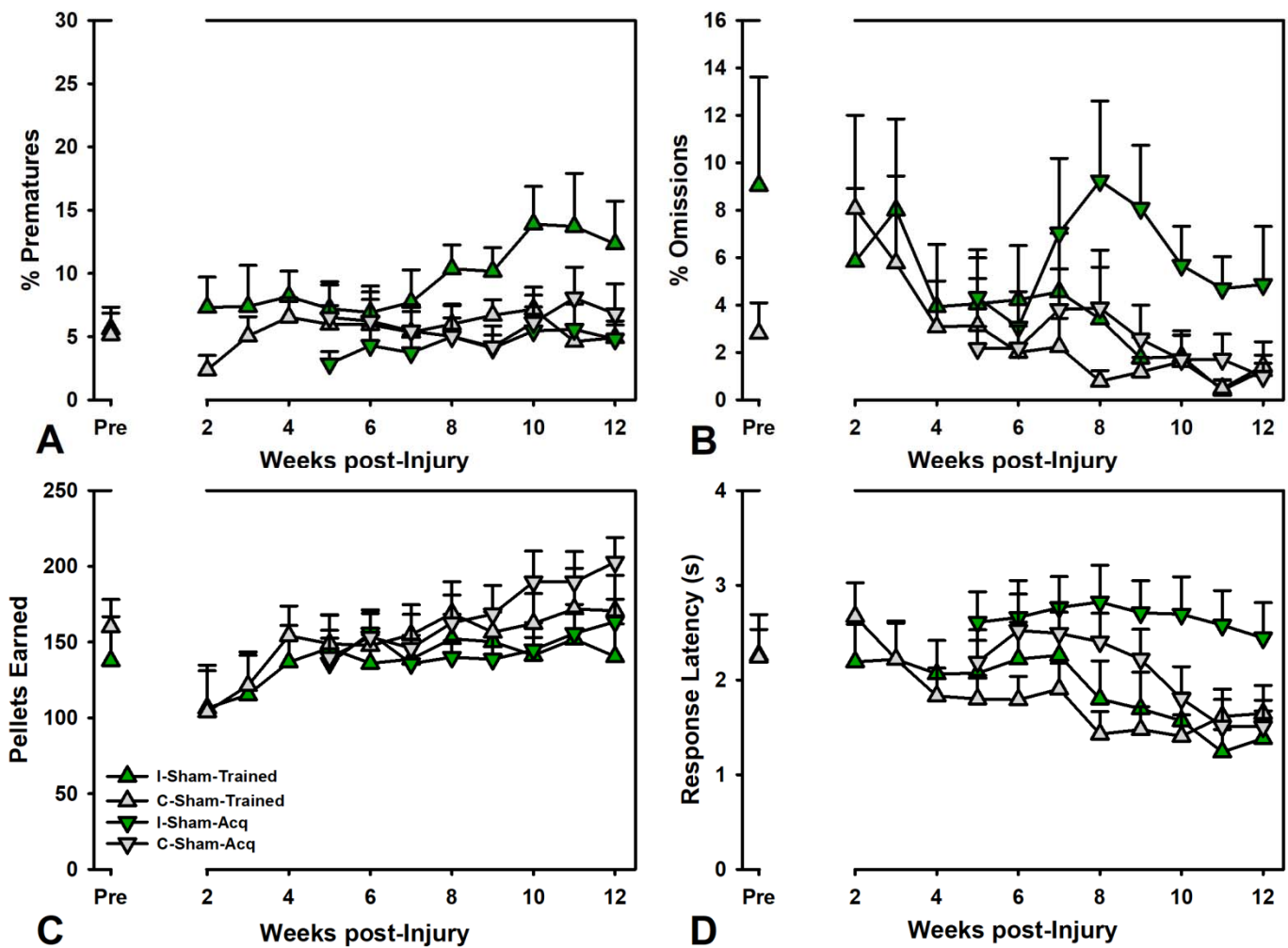
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Figure S1. Sham choice on the RGT. A) Acquisition intact shams learned at a slightly faster rate than craniotomy shams (*p* = 0.035). B) Trained craniotomy shams had a small, but significantly decreased choice of the optimal 2-pellet option (*p* = 0.043), while Acquisition intact shams learned at a slightly faster rate than craniotomy shams (*p* < 0.001). C) Trained intact shams significantly increased choice of the risky 3-pellet option over time (*p* = 0.001). D) Both Trained and Acquisition intact shams significantly reduced choice of the risky 4-pellet option over time (*p*'s < 0.029).
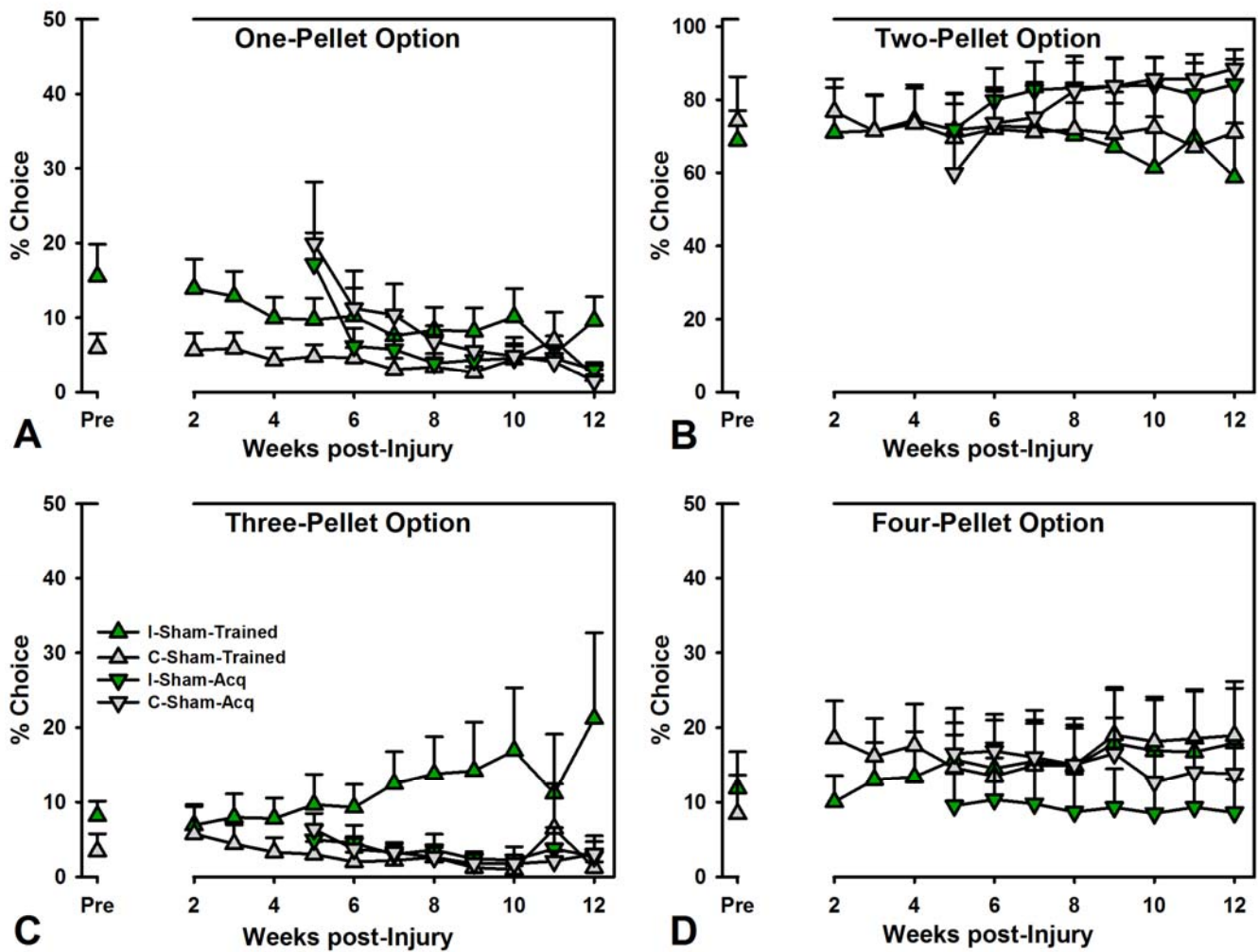
Figure S2. Sham performance on other RGT variables. A) There were no significant group differences in premature responses. B) Acquisition intact shams significantly increased their omissions in the latter half of testing ($p < 0.001$). C) Trained and Acquisition intact shams earned less pellets over time than their craniotomy counterparts (p's < 0.050). D) Acquisition intact shams were slower to decide across the testing period ($p < 0.001$).
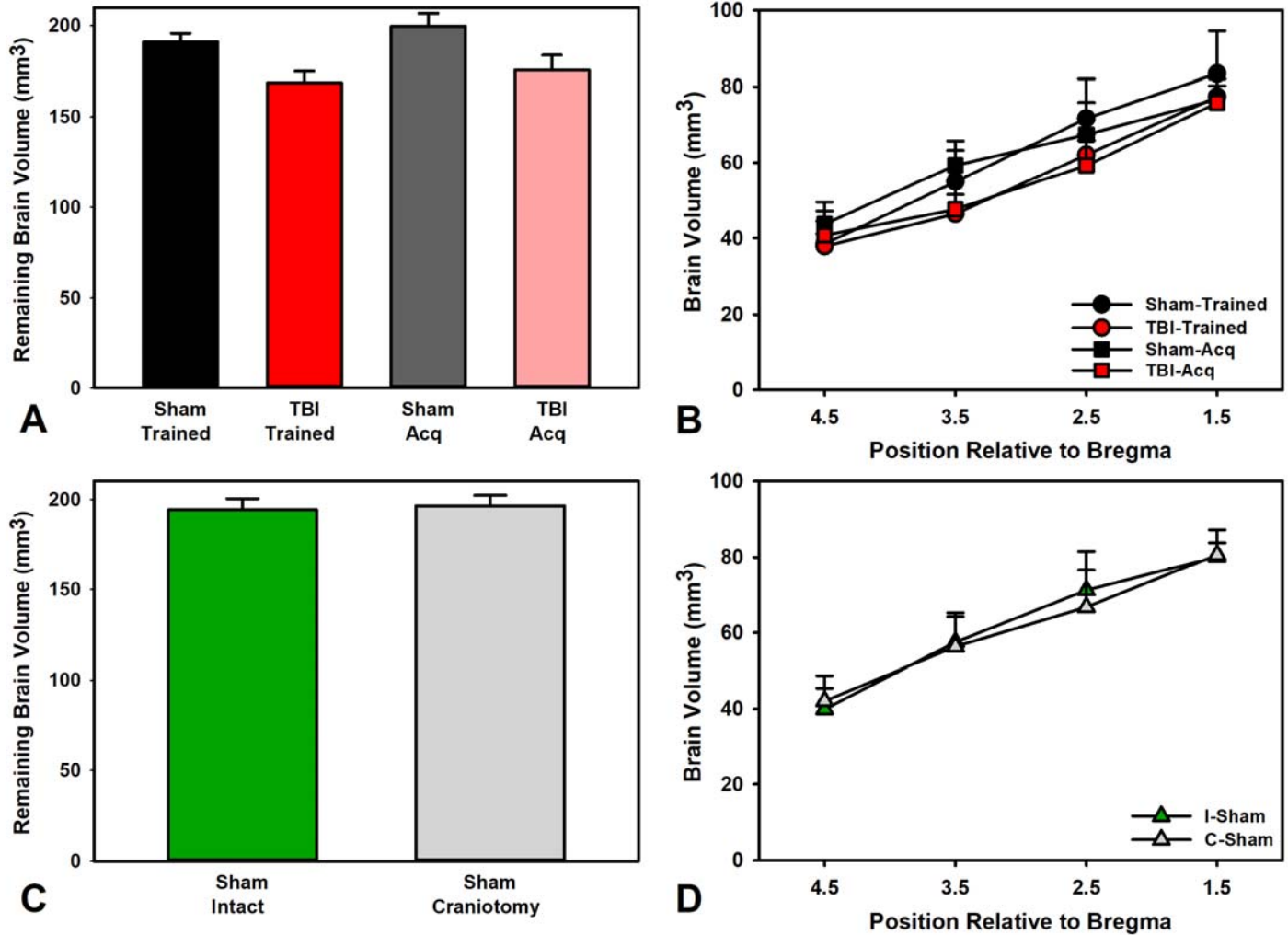
Figure S3. Remaining brain volume. A) Both TBI groups had significantly reduced brain volume relative to their sham controls (p's < 0.037). B) Depiction of average brain volume across the four measured positions. C) There were no significant differences in brain volume between intact and craniotomy shams (p = 0.791). D) Depiction of average brain volume across the four measured positions.

					TBI RGT Behavior				
	Choice				**Other Variables**				
	Trained						**β**	**t**	**p**
		DF	**F**	**p**	Prematures	TBI	-0.37	1.85	0.071
	TBI x Choice x Week	3, 3514	7.092	**<0.001**		Week	0.07	5.16	**<0.001**
		β	**t**	**p**		TBI x Week	0.13	6.93	**<0.001**
P1	TBI	0.43	10.14	**<0.001**	Omissions	TBI	0.88	4.25	**<0.001**
	TBI x Week	-0.01	1.22	0.224		Week	-0.09	7.92	**<0.001**
						TBI x Week	-0.09	5.37	**<0.001**
P2	TBI	-0.65	15.80	**<0.001**	Pellets	TBI	-1.16	5.10	**<0.001**
	TBI x Week	0.04	3.18	**0.002**		Week	0.08	8.35	**<0.001**
						TBI x Week	0.06	4.17	**<0.001**
P3	TBI	0.25	6.19	**<0.001**	Response Lat.	TBI	-0.19	0.59	0.558
	TBI x Week	0.02	1.79	0.073		Week	-0.11	10.05	**<0.001**
						TBI x Week	0.03	2.25	**0.025**
P4	TBI	0.37	8.96	**<0.001**	Collection Lat.	TBI	0.76	3.08	**0.004**
	TBI x Week	-0.03	2.61	**0.009**		Week	-0.05	4.02	**<0.001**
						TBI x Week	-0.06	3.16	**0.002**
	Acquisition						**β**	**t**	**p**
		DF	**F**	**p**	Prematures	TBI	0.54	1.74	0.091
	TBI x Choice x Week	3, 3309	3.66	**0.012**		Week	0.04	3.45	**0.001**
		β	**t**	**p**		TBI x Week	0.04	2.26	**0.024**
P1	TBI	0.59	11.54	**<0.001**	Omissions	TBI	0.13	0.37	0.712
	TBI x Week	0.01	0.46	0.647		Week	-0.03	1.87	0.062
						TBI x Week	-0.04	2.02	**0.044**
P2	TBI	-1.08	21.00	**<0.001**	Pellets	TBI	-0.52	1.85	0.073
	TBI x Week	-0.02	1.37	0.172		Week	0.12	9.91	**<0.001**
						TBI x Week	-0.07	3.77	**<0.001**
P3	TBI	0.56	10.82	**<0.001**	Response Lat.	TBI	-0.31	0.81	0.427
	TBI x Week	0.05	3.16	**0.002**		Week	-0.09	7.91	**<0.001**
						TBI x Week	0.00	0.03	0.976
P4	TBI	0.38	7.35	**<0.001**	Collection Lat.	TBI	1.37	4.08	**<0.001**
	TBI x Week	0.00	0.15	0.880		Week	-0.03	2.29	**0.022**
						TBI x Week	-0.10	4.86	**<0.001**

Table S1. Effects of TBI on RGT behavioral variables.

Amphetamine Data

Choice

Trained Animals

	DF	F	p
TBI x Dose	3, 296	0.12	0.948
Choice x Dose	9, 296	10.82	**<0.001**
TBI x Choice x Dose	9, 296	0.93	0.498

		β	t	p
P1	0.3 mg/kg	0.25	1.40	0.164
	1.0 mg/kg	0.60	3.39	**0.001**
	1.5 mg/kg	0.69	3.36	**0.001**
P2	0.3 mg/kg	-0.18	1.02	0.310
	1.0 mg/kg	-0.71	4.01	**<0.001**
	1.5 mg/kg	-0.73	3.53	**<0.001**
P3	0.3 mg/kg	0.02	0.11	0.914
	1.0 mg/kg	0.28	1.58	0.115
	1.5 mg/kg	0.19	0.93	0.355
P4	0.3 mg/kg	0.06	0.33	0.740
	1.0 mg/kg	0.29	1.65	0.101
	1.5 mg/kg	0.26	1.27	0.206

Acquisition Animals

	DF	F	p
TBI x Dose	3, 276	0.44	0.725
Choice x Dose	9, 276	6.04	**<0.001**
TBI x Choice x Dose	9, 276	1.92	**0.049**

		TBI β	t	p	Sham β	t	p
P1	0.3 mg/kg	0.20	0.99	0.321	0.25	1.40	0.164
	1.0 mg/kg	0.44	2.07	**0.039**	0.60	3.39	**0.001**
	1.5 mg/kg	0.37	1.64	0.102	0.69	3.36	**0.001**
P2	0.3 mg/kg	0.00	0.01	0.991	-0.18	1.02	0.310
	1.0 mg/kg	-0.39	1.87	0.063	-0.71	4.01	**<0.001**
	1.5 mg/kg	-0.18	0.78	0.435	-0.73	3.53	**<0.001**
P3	0.3 mg/kg	-0.12	0.59	0.559	0.02	0.11	0.914
	1.0 mg/kg	-0.08	0.37	0.715	0.28	1.58	0.115
	1.5 mg/kg	-0.12	0.55	0.584	0.19	0.93	0.355
P4	0.3 mg/kg	0.07	0.34	0.733	0.06	0.33	0.740
	1.0 mg/kg	-0.04	0.17	0.865	0.29	1.65	0.101
	1.5 mg/kg	-0.17	0.74	0.459	0.26	1.27	0.206

Other Variables

Trained Animals

Prematures		DF	F	p
	TBI	1, 21	2.32	0.143
	Dose	3, 61	0.92	0.437
	TBI x Dose	3, 61	2.94	**0.040**

		β	t	p
TBI v. Sham	0.0 mg/kg	-0.10	0.22	0.823
TBI v. Sham	0.3 mg/kg	-0.05	0.11	0.911
TBI v. Sham	1.0 mg/kg	-1.29	2.84	**0.007**
TBI v. Sham	1.5 mg/kg	-0.69	1.45	0.154

Omissions		DF	F	p
	TBI	1, 21	0.34	0.569
	Dose	3, 61	2.74	0.051
	TBI x Dose	3, 61	0.66	0.581

Acquisition Animals

Prematures		DF	F	p
	TBI	1, 18	0.68	0.420
	Dose	3, 55	1.49	0.228
	TBI x Dose	3, 55	1.08	0.366

Omissions		DF	F	p
	TBI	1, 19	0.01	0.917
	Dose	3, 55	4.19	**0.010**
	TBI x Dose	3, 55	0.03	0.992

	β	t	p
0.3 mg/kg	-0.27	0.86	0.392
1.0 mg/kg	0.16	0.52	0.605
1.5 mg/kg	0.58	1.89	0.064

Table S2. Effects of amphetamine on RGT performance.

cFos Data		DF	F	P
PL	TBI x Training	1,28	0.00	0.955
	TBI	1,30	0.03	0.868
OFC	TBI x Training	1,31	1.30	0.264
	TBI	1,33	0.42	0.519
dSTR	TBI x Training	1,27	0.00	0.953
	TBI	1,29	0.05	0.827
NAc	TBI x Training	1,26	0.21	0.652
	TBI	1,28	2.66	0.114

Table S3. cFos[+] cell counts.

Sham Comparison

Choice

Trained Animals

		DF	F	p
	Craniotomy x Choice x Week	3, 1839	5.51	**<0.001**
		β	t	p
P1	Craniotomy	-0.09	1.69	0.101
	Craniotomy x Week	0.01	1.26	0.209
P2	Craniotomy	-0.09	2.14	**0.043**
	Craniotomy x Week	0.00	0.10	0.920
P3	Craniotomy	-0.17	3.39	**0.002**
	Craniotomy x Week	-0.04	3.19	**0.001**
P4	Craniotomy	0.21	5.00	**<0.001**
	Craniotomy x Week	0.02	2.19	**0.029**

Acquisition Animals

		DF	F	p
	Craniotomy x Choice x Week	3, 1727	7.84	**<0.001**
		β	t	p
P1	Craniotomy	0.13	2.37	**0.019**
	Craniotomy x Week	-0.04	2.11	**0.035**
P2	Craniotomy	-0.19	3.54	**0.001**
	Craniotomy x Week	0.06	3.71	**<0.001**
P3	Craniotomy	0.02	0.30	0.768
	Craniotomy x Week	0.00	0.19	0.849
P4	Craniotomy	0.14	2.58	**0.011**
	Craniotomy x Week	-0.04	2.34	**0.019**

Other Variables

Trained Animals

		β	t	p
Prematures	Craniotomy	-0.33	1.16	0.258
	Week	0.09	4.71	**0.000**
	Craniotomy x Week	-0.02	0.74	0.460
Omissions	Craniotomy	0.31	0.92	0.372
	Week	-0.09	5.60	**<0.001**
	Craniotomy x Week	-0.03	1.55	0.122
Pellets	Craniotomy	-0.32	1.03	0.322
	Week	0.06	4.33	**<0.001**
	Craniotomy x Week	0.04	1.97	**0.050**
Response Lat.	Craniotomy	-0.01	0.02	0.982
	Week	-0.10	7.50	**<0.001**
	Craniotomy x Week	-0.02	0.88	0.381
Collection Lat.	Craniotomy	-0.27	0.71	0.487
	Week	-0.07	3.45	**0.001**
	Craniotomy x Week	0.01	0.56	0.576

Acquisition Animals

		β	t	p
Prematures	Craniotomy	0.68	1.65	0.109
	Week	0.07	2.95	**0.003**
	Craniotomy x Week	-0.03	0.87	0.383
Omissions	Craniotomy	0.29	0.61	0.550
	Week	0.02	1.19	0.235
	Craniotomy x Week	-0.11	3.93	**<0.001**
Pellets	Craniotomy	-0.70	1.62	0.122
	Week	0.07	3.60	**<0.001**
	Craniotomy x Week	0.14	4.85	**<0.001**
Response Lat.	Craniotomy	0.50	0.99	0.342
	Week	-0.03	2.10	**0.037**
	Craniotomy x Week	-0.13	5.36	**<0.001**
Collection Lat.	Craniotomy	-0.10	0.19	0.855
	Week	-0.05	2.65	**0.008**
	Craniotomy x Week	0.03	1.16	0.246

Table S4. Comparison of craniotomy and intact shams.