

Impact of ocean warming and acidification on the behaviour of two co-occurring gadid species, *Boreogadus saida* and *Gadus morhua*, from Svalbard

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Table S1: Carbonate chemistry, temperatures as well as animal lengths and weights of the incubation of *Boreogadus saida*. The table depicts mean and standard deviation for the parameters of each treatment group over the entire incubation period. “low” and “high” indicate control and high CO₂ concentrations. Lengths and weights are given for beginning/end of the incubation period.

	Salinity (PSU)	Alkalinity ($\mu\text{mol/kgSW}$)	CO ₂ ($\mu\text{mol/kgSW}$)	pH _{tot}	pCO ₂ (μatm)	HCO ₃ ⁻ ($\mu\text{mol/kgSW}$)	CO ₃ ²⁻ ($\mu\text{mol/kgSW}$)	ΩCa	ΩAr	Temperature (°C)	Length (cm)	Weight (g)
0 °C low												
Mean	30.03	2445.27	2318.66	8.10	373.69	2192.05	103.22	2.52	1.57	0.75	13.7/14.3	16.3/19.7
SD	1.23	83.92	73.07	0.04	34.24	66.79	13.81	0.33	0.21	0.41	1.5/1.6	6.5/7.0
0 °C high												
Mean	29.97	2449.60	2456.20	7.68	1056.97	2348.37	41.15	1.01	0.63	0.31	13.8/14.2	15.3/18.6
SD	1.30	76.69	83.62	0.05	135.56	77.83	2.39	0.06	0.04	0.44	1.3/1.4	5.2/5.5
3 °C low												
Mean	29.96	2465.76	2340.26	8.05	425.07	2212.11	103.97	2.54	1.58	3.30	14.0/14.8	17.1/22.5
SD	1.02	52.12	49.53	0.02	28.93	46.97	6.05	0.14	0.09	0.11	1.4/1.5	5.7/6.0
3 °C high												
Mean	29.91	2440.40	2435.75	7.68	1073.06	2328.78	45.56	1.11	0.69	3.01	14.8/15.6	20.9/26.1
SD	0.91	52.68	54.26	0.05	131.51	50.84	4.18	0.10	0.06	0.07	1.1/1.1	5.8/5.8
6 °C low												
Mean	31.76	2253.07	2128.06	8.01	435.27	2006.99	98.81	2.39	1.50	5.74	13.9/15.0	15.1/21.8
SD	0.64	34.30	31.71	0.02	18.73	30.05	5.39	0.13	0.08	0.23	0.8/0.6	4.1/2.9
6 °C high												
Mean	31.77	2224.45	2213.15	7.64	1076.53	2113.71	44.27	1.07	0.67	5.71	14.8/15.8	18.2/25.8
SD	0.62	39.56	40.90	0.03	73.15	38.95	3.10	0.07	0.05	0.24	1.3/1.2	5.0/6.1
8 °C low												
Mean	33.43	2443.40	2275.64	8.04	433.47	2126.43	128.99	3.10	1.96	8.24	14.3/15.1	15.6/21.2
SD	0.68	27.98	22.26	0.02	16.98	19.07	5.16	0.12	0.08	0.14	1.5/1.5	4.6/5.8
8 °C high												
Mean	33.43	2436.57	2381.74	7.71	1026.75	2263.12	70.90	1.70	1.08	8.19	14.6/15.2	18.7/21.7
SD	0.69	31.43	25.46	0.06	103.48	40.78	25.30	0.61	0.38	0.16	2.4/2.2	11.9/10.0

Table S2: Carbonate chemistry, temperatures as well as animal lengths and weights of the incubation of *Gadus morhua*. The table depicts mean and standard deviation for the parameters of each treatment group over the entire incubation period. “low” and “high” indicate control and high CO₂ concentrations. Lengths and weights are given for beginning/end of the incubation period.

	Salinity (PSU)	Alkalinity ($\mu\text{mol/kgSW}$)	CO ₂ ($\mu\text{mol/kgSW}$)	pH _{tot}	pCO ₂ (μatm)	HCO ₃ ⁻ ($\mu\text{mol/kgSW}$)	CO ₃ ²⁻ ($\mu\text{mol/kgSW}$)	ΩCa	ΩAr	Temperature (°C)	Length (cm)	Weight (g)
3 °C low												
Mean	31.55	2092.48	1996.12	7.96	449.89	1893.19	78.64	1.91	1.20	3.11	18.4/18.9	43.3/47.4
SD	0.25	94.64	90.42	0.03	30.15	85.44	5.55	0.14	0.08	0.22	2.1/2.2	14.7/17.9
3 °C high												
Mean	31.59	2079.98	2098.94	7.54	1265.44	1999.10	31.82	0.77	0.48	3.15	19.5/20.0	51.9/58.6
SD	0.25	99.30	102.86	0.05	144.43	98.31	4.06	0.10	0.06	0.18	1.7/1.8	16.5/18.1
8 °C low												
Mean	32.93	2327.67	2179.15	8.02	437.44	2043.75	114.60	2.76	1.74	8.20	18.4/19.3	44.2/57.7
SD	0.26	60.41	49.68	0.01	10.23	42.25	8.31	0.20	0.13	0.09	2.7/3.3	24.2/36.7
8 °C high												
Mean	32.19	2316.33	2258.62	7.77	851.98	2150.19	67.75	1.53	0.96	8.11	17.6/18.3	39.0/46.8
SD	2.12	49.46	41.91	0.09	109.85	41.40	11.60	0.25	0.16	0.13	2.2/2.4	16.0/21.0
12 °C low												
Mean	31.67	2474.28	2292.30	8.03	458.27	2131.77	141.34	3.43	2.17	12.30	18.0/19.9	38.4/56.1
SD	0.22	64.54	54.46	0.04	45.53	49.87	14.96	0.36	0.23	0.43	2.7/2.1	14.1/23.8
12 °C high												
Mean	31.74	2462.05	2415.41	7.67	1137.25	2301.65	66.02	1.60	1.02	12.16	17.5/19.5	36.9/58.2
SD	0.26	27.34	26.68	0.03	91.64	25.41	5.34	0.13	0.08	0.35	2.2/2.6	14.9/26.6
16 °C low												
Mean	32.58	1970.21	1840.24	7.90	515.25	1723.54	97.41	2.36	1.51	15.73	17.8/19.4	37.8/55.4
SD	0.26	99.13	88.19	0.03	25.84	79.57	9.70	0.23	0.15	0.41	2.2/2.4	14.3/24.5
16 °C high												
Mean	32.55	1961.32	1947.82	7.50	1416.11	1851.16	43.52	1.05	0.67	15.71	18.8/20.8	44.8/75.2
SD	0.30	94.98	74.37	0.12	357.17	71.66	13.36	0.32	0.21	0.44	2.8/3.4	23.2/41.4



Figure S1: Representative incubation system of one treatment group with 12 animals. Each grey tank contains a single individual. Water supply is given from one header tank (white container on top) for each treatment group, in which water is pre-gassed in accordance to the respective CO₂ treatment (Photograph courtesy of Kristina Kunz).

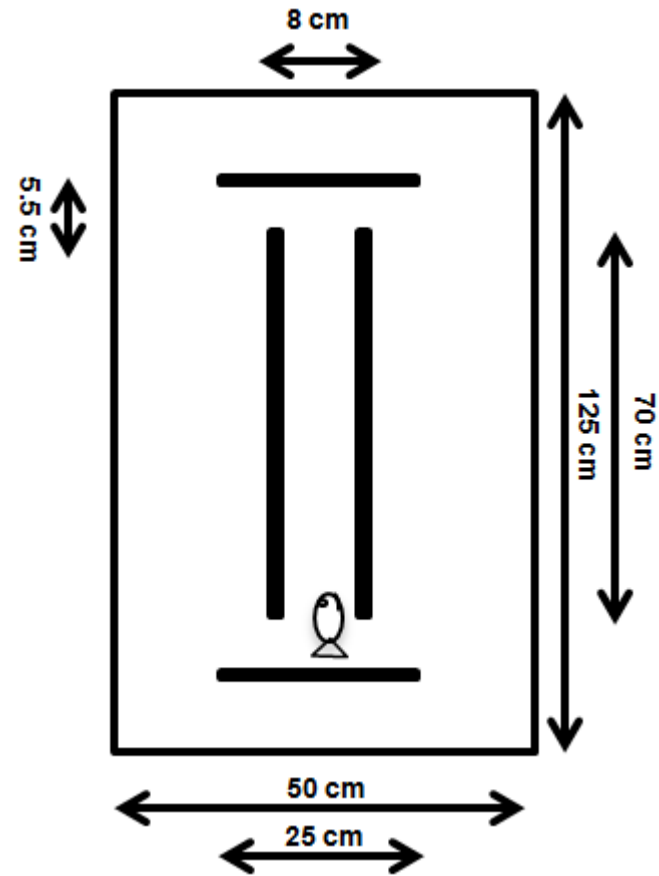


Figure S2: Sketch of two sided T-maze for a Detour test. Relations in this image are not to scale.