

APPENDIX H-4.

Interaction Tables for the Psychological Assessment Occupation Removed from Final Model

This appendix contains exposure analyses results of interactions between covariates and dioxin after occupation has been removed from those final dioxin models (Models 2 through 6) that contained occupation. These tables are supplements to tables in Appendix H-3, which are main effects results with occupation removed from the model. Results are presented for separate strata of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The analysis model, covariate involved in the interaction, and a reference to the analysis tables in Chapter 12 and Appendix H-3 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix H-4 Table	Chapter 12 Table	Appendix H-3 Table	Dependent Variable	Model	Covariate
H-4-1	12-7	H-3-3	Other Neuroses	3 4 5 6	Lifetime Alcohol History, Education, Current Total Household Income, Combat Service Lifetime Alcohol History Lifetime Alcohol History Lifetime Alcohol History
H-4-2	12-8	H-3-4	SCL-90-R Anxiety	2	Current Alcohol Use
H-4-3	12-12	H-3-9	SCL-90-R Obsessive-Compulsive Behavior	2	Current Total Household Income
H-4-4	12-13	H-3-10	SCL-90-R Paranoid Ideation	3 4 5 6	Current Marital Status Current Marital Status, Combat Service Current Marital Status, Combat Service Current Marital Status, Combat Service
H-4-5	12-15	H-3-12	SCL-90-R Psychoticism	3	Current Alcohol Use
H-4-6	12-18	H-3-16	SCL-90-R Positive Symptom Total	2	Current Total Household Income

Table H-4-1.
Interaction Table for Other Neuroses
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Comparison	53	28.3		
	Background RH	19	31.6	1.04 (0.33,3.33)	0.947
	Low RH	14	28.6	0.94 (0.25,3.57)	0.932
	High RH	24	41.7	1.48 (0.52,4.19)	0.457
	Low plus High RH	38	36.8	1.27 (0.51,3.18)	0.611
>0-40 Drink-years	Comparison	696	33.9		
	Background RH	251	30.7	0.99 (0.70,1.39)	0.947
	Low RH	165	40.6	1.32 (0.90,1.93)	0.149
	High RH	161	42.9	1.29 (0.88,1.90)	0.186
	Low plus High RH	326	41.7	1.31 (0.96,1.78)	0.084
>40 Drink-years	Comparison	273	50.6		
	Background RH	82	51.2	1.16 (0.69,1.94)	0.581
	Low RH	68	54.4	1.26 (0.72,2.21)	0.412
	High RH	63	58.7	1.14 (0.63,2.05)	0.672
	Low plus High RH	131	56.5	1.20 (0.77,1.89)	0.422

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Education: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
High School	Comparison	474	40.5		
	Background RH	115	53.9	1.87 (1.20,2.91)	0.006
	Low RH	122	52.5	1.73 (1.12,2.68)	0.013
	High RH	171	52.1	1.60 (1.08,2.38)	0.019
	Low plus High RH	293	52.2	1.66 (1.18,2.32)	0.003
College	Comparison	548	36.0		
	Background RH	237	26.6	0.69 (0.48,1.00)	0.049
	Low RH	125	35.2	1.01 (0.66,1.55)	0.965
	High RH	77	35.1	0.93 (0.55,1.57)	0.790
	Low plus High RH	202	35.2	0.98 (0.68,1.41)	0.910

Table H-4-1. (Continued)
Interaction Table for Other Neuroses
Occupation Removed from Final Model

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Total Household Income: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
≤\$55,000	Comparison	501	45.3		
	Background RH	129	45.7	1.02 (0.67,1.56)	0.923
	Low RH	103	54.4	1.45 (0.92,2.31)	0.111
	High RH	158	43.7	0.89 (0.59,1.33)	0.567
	Low plus High RH	261	47.9	1.08 (0.77,1.52)	0.646
>\$55,000	Comparison	521	31.1		
	Background RH	223	29.6	1.00 (0.70,1.45)	0.983
	Low RH	144	36.1	1.23 (0.82,1.86)	0.319
	High RH	90	52.2	2.36 (1.46,3.83)	<0.001
	Low plus High RH	234	42.3	1.59 (1.13,2.25)	0.008

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Combat Service: Tables 12-7 and H-3-3)					
Stratum	Dioxin Category	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
<360 Days	Comparison	789	37.9		
	Background RH	64	42.2	1.17 (0.68,2.01)	0.566
	Low RH	26	26.9	0.46 (0.18,1.16)	0.102
	High RH	26	57.7	2.00 (0.88,4.56)	0.097
	Low plus High RH	52	42.3	1.00 (0.55,1.82)	0.990
≥360 Days	Comparison	233	38.6		
	Background RH	288	34.0	0.92 (0.63,1.34)	0.655
	Low RH	221	45.7	1.35 (0.91,1.99)	0.137
	High RH	222	45.5	1.10 (0.74,1.63)	0.649
	Low plus High RH	443	45.6	1.22 (0.86,1.71)	0.262

Table H-4-1. (Continued)
Interaction Table for Other Neuroses
Occupation Removed from Final Model

e) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)				
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)
	Current Dioxin	n	Percent Yes	
0 Drink-years	Low	17	23.5	1.15 (0.81,1.62) 0.446
	Medium	18	27.8	
	High	23	47.8	
>0-40 Drink-years	Low	202	29.7	1.08 (0.95,1.22) 0.223
	Medium	194	38.7	
	High	189	43.4	
>40 Drink-years	Low	66	47.0	0.96 (0.79,1.17) 0.704
	Medium	77	59.7	
	High	72	55.6	

f) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)				
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)
	Current Dioxin	n	Percent Yes	
0 Drink-years	Low	18	33.3	1.17 (0.86,1.58) 0.320
	Medium	14	21.4	
	High	26	42.3	
>0-40 Drink-years	Low	204	28.9	1.09 (0.98,1.22) 0.101
	Medium	199	38.2	
	High	182	45.1	
>40 Drink-years	Low	67	46.3	0.97 (0.83,1.13) 0.682
	Medium	74	59.5	
	High	74	56.8	

Table H-4-1. (Continued)
Interaction Table for Other Neuroses
Occupation Removed from Final Model

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Tables 12-7 and H-3-3)			
Current Dioxin Category Summary Statistics		Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Yes
0 Drink-years	Low	18	33.3
	Medium	14	21.4
	High	26	42.3
>0-40 Drink-years	Low	203	28.6
	Medium	199	38.2
	High	182	45.1
>40 Drink-years	Low	67	46.3
	Medium	74	59.5
	High	74	56.8

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = $>$ 8.1-20.5 ppt; High = $>$ 20.5 ppt.

Models 5 and 6: Low = \leq 46 ppq; Medium = $>$ 46-128 ppq; High = $>$ 128 ppq.

Table H-4-2.
Interaction Table for SCL-90-R Anxiety
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Alcohol Use: Tables 12-8 and H-3-4)					
Stratum	Initial Dioxin Category Summary Statistics			Analysis Results for Log₂ (Initial Dioxin)	
	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	126	6.4	1.20 (0.93,1.55)	0.167
	Medium	134	9.7		
	High	136	13.2		
>1 Drink/Day	Low	41	9.8	0.44 (0.19,1.03)	0.058
	Medium	33	6.1		
	High	30	3.3		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table H-4-3.
Interaction Table for SCL-90-R Obsessive-Compulsive Behavior
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Total Household Income: Tables 12-12 and H-3-9)					
Stratum	Initial Dioxin Category	Summary Statistics		Analysis Results for Log ₂ (Initial Dioxin)	
		Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a
≤\$55,000	Low	71	15.5	1.04 (0.79,1.36)	0.778
	Medium	83	8.4		
	High	110	13.6		
>\$55,000	Low	96	7.3	1.32 (0.93,1.88)	0.122
	Medium	84	8.3		
	High	56	12.5		

^a Relative risk for a twofold increase in initial dioxin.

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table H-4-4.
Interaction Table for SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Marital Status: Tables 12-13 and H-3-10)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Married	Comparison	894	3.9		
	Background RH	317	6.6	2.07 (1.16,3.68)	0.014
	Low RH	216	4.6	1.18 (0.57,2.44)	0.663
	High RH	213	5.6	1.20 (0.60,2.39)	0.599
	Low plus High RH	429	5.1	1.19 (0.68,2.07)	0.542
Not Married	Comparison	137	5.8		
	Background RH	42	4.8	0.93 (0.18,4.72)	0.926
	Low RH	33	9.1	1.69 (0.40,7.08)	0.474
	High RH	38	26.3	5.37 (1.87,15.42)	0.002
	Low plus High RH	71	18.3	3.57 (1.36,9.38)	0.010

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13 and H-3-10)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Current Dioxin + 1)	
	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	249	6.8	0.87 (0.70,1.08)	0.202
	Medium	250	4.0		
	High	247	6.5		
Not Married	Low	35	2.9	1.40 (0.95,2.07)	0.087
	Medium	37	10.8		
	High	41	24.4		

Table H-4-4. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-360 Days	Low	55	9.1	0.80 (0.44,1.45)	0.460
	Medium	33	3.0		
	High	29	3.5		
>360 Days	Low	229	5.7	0.98 (0.80,1.19)	0.824
	Medium	254	5.1		
	High	259	9.7		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Married	Low	250	6.8	0.91 (0.76,1.09)	0.300
	Medium	250	4.8		
	High	246	5.7		
Not Married	Low	38	2.6	1.39 (0.98,1.96)	0.066
	Medium	37	13.5		
	High	38	23.7		

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13 and H-3-10)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0-360 Days	Low	57	8.8	0.86 (0.53,1.38)	0.522
	Medium	28	3.6		
	High	32	3.1		
>360 Days	Low	231	5.6	1.01 (0.85,1.19)	0.938
	Medium	259	6.2		
	High	252	8.7		

Table H-4-4. (Continued)
Interaction Table for SCL-90-R Paranoid Ideation
Occupation Removed from Final Model

f) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Marital Status: Table 12-13 and H-3-10)				
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b
Married	Low	249	6.8	0.89 (0.73,1.07) 0.213
	Medium	250	4.8	
	High	246	5.7	
Not Married	Low	38	2.6	1.35 (0.94,1.93) 0.099
	Medium	37	13.5	
	High	38	23.7	

g) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Combat Service: Table 12-13 and H-3-10)				
Current Dioxin Category Summary Statistics				Analysis Results for \log_2 (Current Dioxin + 1)
Stratum	Current Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^b
0-360 Days	Low	57	8.8	0.83 (0.52,1.33) 0.442
	Medium	28	3.6	
	High	32	3.1	
>360 Days	Low	230	5.7	0.98 (0.81,1.17) 0.788
	Medium	259	6.2	
	High	252	8.7	

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = $>$ 8.1-20.5 ppt; High = $>$ 20.5 ppt.

Models 5 and 6: Low = \leq 46 ppq; Medium = $>$ 46-128 ppq; High = $>$ 128 ppq.

Table H-4-5.
Interaction Table for SCL-90-R Psychoticism
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Tables 12-15 and H-3-12)					
Stratum	Dioxin Category	n	Percent High	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/ Day	Comparison	818	8.1		
	Background RH	277	6.9	0.93 (0.54,1.60)	0.794
	Low RH	190	7.9	0.89 (0.49,1.61)	0.692
	High RH	206	11.7	1.37 (0.82,2.28)	0.226
	Low plus High RH	396	9.9	1.13 (0.74,1.73)	0.572
>1-4 Drinks/ Day	Comparison	179	7.8		
	Background RH	75	14.7	2.29 (0.96,5.46)	0.061
	Low RH	56	5.4	0.67 (0.18,2.44)	0.539
	High RH	40	10.0	0.88 (0.27,2.94)	0.841
	Low plus High RH	96	7.3	0.77 (0.30,2.02)	0.597
>4 Drinks/ Day	Comparison	34	8.8		
	Background RH	7	28.6	6.89 (0.85,55.48)	0.070
	Low RH	3	33.3	5.16 (0.27,97.48)	0.274
	High RH	5	0.0	--	--
	Low plus High RH	8	12.5	1.20 (0.10,15.11)	0.887

^a Relative risk and confidence interval relative to Comparisons.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table H-4-6.
Interaction Table for Positive Symptom Total
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Total Household Income: Tables 12-18 and H-3-16)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent High	Adjusted Relative Risk (95% C.I.) ^a	p-Value
≤\$55,000	Low	71	16.9	0.96 (0.74,1.25)	0.768
	Medium	83	14.5		
	High	110	15.5		
>\$55,000	Low	96	8.3	1.26 (0.81,1.97)	0.304
	Medium	84	4.8		
	High	56	16.1		

^a Relative risk for a twofold increase in initial dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.